THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXIII. | DETROIT, MICH., JUNE 15, 1909. | Third Series, Vol. XXV, No. 6.

ORIGINAL COMMUNICATIONS.

THE PREVENTION OF TROPICAL ABSCESS OF THE LIVER BY THE TREATMENT OF THE PRESUPPURATIVE STAGE WITH IPECACUANHA.

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INTRODUCTION.

Many of our most valued drugs have first been used by untrained herbalists, and even when taken up by the medical profession have for long been prescribed on purely empirical lines, yet later have been shown by scientific investigation to be of great importance. Until, however, their use has been placed on the sure footing of definite knowledge great fluctuations of opinion regarding their value in different conditions are liable to occur. Such has been the fate of ipecacuanha, a drug with a long Indian history of valuable service, but one which has fallen into undeserved neglect in recent times, so that two years ago a committee of London therapeutists, with little or no tropical experience, actually suggested its being omitted from the field service pannier for use on Indian military expeditions. The reason for this change of view is not far to seek, for the disease in which the drug has been found to be of the greatest value in India is in the treatment of dysentery, which we now know to comprise at least two great classes of pathological processes, the bacillary and the amebic groups, which are not equally amenable to the same lines of treatment. Annesley, the great Madras physician, as early as 1828 divided this disease into uncomplicated and hepatic dysenteries, the latter comprising those cases in which symptoms of involvement of the liver occurred. This acute clinical differentiation largely corresponds with the present-day classification, for it is the amebic form which is so closely related to acute hepatitis, although rarely suppurative pylephlebitis may follow the sloughing bacillary form, but is seldom diagnosed during life.

During the last few years the saline treatment of dysentery has to a large extent superseded the use of ipecacuanha, even in India, but it is worthy of note that this has especially been the case in South Africa during the Boer war, and in Indian jails, in both of which tropical liver abscess, the most important complication of the amebic form of dysentery, is extremely rare. A few observations I made several years ago in Calcutta indicated that even in this home of amebic abscess the majority of cases of dysentery were still bacillary in origin, although further experience has shown me that the amebic form is commoner than I at first thought. A recent investigation of Bengal jail dysentery by Captain Forster, I.M.S., has shown that the great majority of such cases are bacillary, mostly of the Shiga type, although some are due to Flexner's bacillus. We see from this that where ipecacuanha treatment has failed the vast majority of the cases were bacillary in nature, in early cases of which the saline treatment gives the best results. On the

other hand, in my experience the value of ipecacuanha is far greater in amebic dysentery, although in advanced cases with secondary infections it often has to be supplemented by other measures. If the above view is correct the comparative neglect of ipecacuanha of recent years is largely due to its having been given in unsuitable cases, and further knowledge of the clinical differentiation of the various types of dysentery is urgently needed for guidance in the appropriate treatment of this class of disease.

A further and equally important use for ipecacuanha is in the treatment of the hepatic complications of amebic dysentery. A generation ago Maclean and Norman Chevers recommended large doses of the drug in acute hepatitis, actually in order to prevent suppuration taking place, but unfortunately this practice has also largely fallen into abeyance with the comparative neglect of the drug in dysentery, the empirical nature of its use not being sufficiently firmly based to prevent this regrettable reaction.

THE WRITER'S RESEARCHES ON AMEBIC HEPATITIS.

During the last nine years I have enjoyed exceptionally favorable opportunities for investigating amebic diseases in Calcutta, and have gradually come to the conclusion that amebic abscess of the liver is an easily preventable disease, so a brief outline of the data on which this view is based may be of interest. At the time I commenced work amebic dysentery had been recognized by Councilman and Lafleur in America, and by Kartulis in Egypt, while in both countries, as well as in India, living amebæ had been found in a small number of tropical liver abscesses, but in under half the cases examined, its pathogenicity being not at all generally accepted. In 1902[1] I published the results of two years' work, during which by examining scrapings from the walls of liver abscesses either post mortem, at the time of operation, or at a subsequent dressing, I found living amebæ in 35 out of 37 consecutive cases, the two negative ones not being examined until twelve or more days after opening, when the infection may have died out. Moreover, in two-thirds of the cases the pus was sterile on culture for bacteria, while in recent series with more careful sterilization of test-tubes, etc., 80 per cent were at first sterile. Unfortunately, in the hot, damp Calcutta climate it is very exceptional that the contents remain sterile after the abscess has been opened a few days.[2]

At this time the relationship of amebic abscess to preceding dysentery was in a very unsettled state. Dr. Andrew Duncan, in opening a discussion on the subject at the British Medical Association in 1902, expressed the opinion that the two diseases were not causally related. In my paper read at the same meeting I showed that, where both a history of the case and a post-mortem was obtainable in fatal amebic abscesses, dysentery could be proved to have been present in 90 per cent, and in my experience it was always of the amebic type. In 12.5 per cent a history of dysentery had been obtained, but no ulcers were present post mortem, having previously healed, while in no less than 20 per cent there had been no symptoms or history of dysentery, yet amebic ulcers were found post mortem, often limited to the cecum and ascending colon. The few remaining cases may be explained by similar latent antecedent ulcers having also healed before the liver abscess proved fatal, often after several months of hepatic trouble. I therefore concluded that amebic abscess of the liver is always preceded by active or latent amebic dysentery, to which it is secondary.

At this stage I investigated the effect of certain drugs on the amebæ of liver abscesses, which led me to advocate aspiration and injection of quinine solutions in the place of draining early cases, and reported two successful cases of this treatment.[3] Others have since published similar results, but in large abscesses a single injection is not sufficient, although recently two cases of 86 and 72 ounces liver abscesses respectively have become encysted after three or four such aspirations and quinine injections.

The solution used at present is 10 grains to the ounce of the soluble bihydrochloride, up to four ounces being injected at a time.

It was while doing blood counts in cases of acute hepatitis with a view to the early detection of suppuration in the liver for the quinine injection treatment that I ascertained that leucocytosis occurs in amebic hepatitis long before any suppuration has taken place, repeated exploratory aspiration, even with the abdominal cavity open, failing to locate any pus in several cases with marked leucocytosis, who subsequently lost their fever and hepatic symptoms completely. The majority of such cases had no symptoms of dysentery while in hospital, and frequently also no history of the disease. Nevertheless, from my previous experience related above I felt sure there must have been latent amebic ulcers in these patients also at some time or other before the hepatitis set in, so I determined to treat all such cases, in which signs of actual suppuration were not clearly evident on admission, with large doses of ipecacuanha, in the hope that the amebic disease might be healed and the secondary infection of the liver prevented. The results exceeded my most sanguine expectations, and in 1907[4] I was able to publish twelve cases of acute hepatitis treated at the European General Hospital, Calcutta, in the great majority of which the temperature fell to normal within two to six days, the hepatic pain and increase in size of the liver also rapidly subsiding, although in six of them fever had previously been present for from thirty-four to fifty-three days. In this series the symptoms had been so acute that in three of them aspiration of the liver for pus had been undertaken, with a negative result. In only three of these cases had dysentery been recently present, while in three no definite symptoms of hepatitis were noted, and I was only led to adopt the treatment by finding a marked leucocytosis in an obscure fever, with only 70 to 80 per cent of polynuclears, this being the usual type of blood change in amebic hepatitis.

FURTHER RECENT EXPERIENCE OF IPECACUANHA TREATMENT OF AMEBIC HEPATITIS.

If my contention is right that amebic hepatitis can be detected and readily cured in the presuppurative stage, and abscess formation thus certainly prevented, then the reintroduction and placing of this method on a sound scientific basis is clearly a matter of the greatest practical importance, and no apology is needed for putting my further experience on record. This can best be done by giving a brief analysis of the more important features of 25 further cases treated at the Calcutta European Hospital during 1907 and 1908.

Previous Dysentery. — Among the 25 cases there was a history of antecedent dysentery in only 12, including two with symptoms in hospital, two with a history of the disease within a few days before admission, and eight which had suffered from it at periods varying between one and thirty months previously. In another case there had been recent diarrhea. One patient had suffered from liver abscess two and a half years ago, and three more had had previous attacks of acute hepatitis.

Hepatic Symptoms.—These varied greatly in severity. In four instances they were so acute that the patients were sent from distant places to Calcutta for operation for liver abscess, while in many of them a suspicion of suppuration was entertained in hospital. In nearly all the liver was enlarged below the costal margin, and in some the dulness was increased upward. In nearly all the more acute cases *x*-rays showed the right diaphragm to be high and either motionless or moving much less than normal. In a minority the symptoms were less acute, with history of fever for several weeks.

Duration of Illness.—In eleven cases there was a history of fever for a month or more, but in six the patients came under treatment within the first week. The duration of the fever after full doses of ipecacuanha were given was not over seven days in 19 of the cases, while in others the temperature had fallen to a low point within

that period. The first sign of improvement noticed was a marked diminution of the hepatic pain, then the fever began to fall, and lastly the size of the liver decreased. Soon after the temperature has fallen to normal the diaphragm is nearly always found to have regained its proper range of movement. In one case there was some opacity at the base of the right lung on admission, which also completely cleared up. If the pain and fever continue undiminished for several days liver abscess should be suspected, although if the pain diminishes the persistence of slight fever for beyond a week may still be followed by complete resolution. The blood was not examined in all these cases, as it was often important to commence the treatment without any delay, but in nine cases of which I have records leucocytosis was present in all. This affords strong evidence of the acuteness of the majority of them. Indeed, I know of nothing so striking as the rapid subsidence of a very acute hepatitis threatening liver abscess under treatment by large doses of ipecacuanha, and I have received numerous letters from medical men in various parts of India describing the effects as "marvelous."

I have mentioned that in my first series of cases several were aspirated for liver abscess with a negative result, and subsequently rapidly cured by the drug treatment. Such cases are absent from the present series, because, unless there is the clearest possible evidence of abscess formation, ipecacuanha is always given before an exploratory operation is undertaken. During the last month, however, an exception occurred in the case of an elderly female patient with very acute hepatitis, whose right diaphragm became fixed while taking ipecacuanha, but a negative exploration was subsequently followed by complete subsidence of all the symptoms, including the fever. The possibility of a small abscess becoming encysted here suggests itself.

Result of the Occurrence of Liver Abscess.—Before I introduced this treatment at the Calcutta European Hospital it was a matter of frequent occurrence for a patient to be admitted for acute or subacute hepatitis, and after being under treatment with ammonium chloride and other drugs for several weeks, the signs of abscess formation supervened and necessitated operative measures. The benefits derived from the present system may be briefly, but strikingly, summed up by recording the simple fact that during the last three years no patient has developed a liver abscess in the open wards of this hospital with 100 beds for European male patients, while several cases sent for operation for this dread disease have recovered completely under ipecacuanha treatment, having fortunately come under treatment while still in the presuppurative stage. An analysis of a number of liver abscess cases showed that in Europeans symptoms of fever and hepatitis had been present for a month or more in 50 per cent, while in 34 per cent more they had been evident for from two to four weeks, and in four cases the time was only nine to thirteen days. In Indian patients the periods were still longer, so that it is clear that in the vast majority of instances there is ample time for the diagnosis and efficient treatment of the disease in the presuppurative stage. In fact I am now prepared to say that amebic abscess of the liver is a preventable disease in patients coming early under skilled treatment, and ought soon to become a very exceptional occurrence, which should cause serious questionings in the mind of the medical man under whose hands it has been allowed to develop.

THE USE OF IPECACUANHA AFTER OPERATION FOR LIVER ABSCESS TO PREVENT RECURRENCES.

I have shown that in post-mortems on liver abscess subjects latent amebic ulcers, which have given no sign of their presence while the patient was in hospital, are frequently found. As it has not hitherto been the practice to take any routine steps to remove this cause of suppurative hepatitis, it is not very surprising that fresh abscesses not rarely form in the liver, either

while the patient is under surgical treatment for the first, or within a year or two of his recovery. I have therefore advised that every patient operated on for liver abscess (whether by the open method or by my plan of repeated aspiration and quinine injection) should also be given a course of large doses of ipecacuanha as soon as he is able to stand it. Several recent cases have confirmed the importance of this routine. Thus, Captain Foster Reany, I.M.S., has reported to me the case of a native soldier, who developed fever when almost convalescent from operation for liver abscess, but the threatening symptoms rapidly subsided under ipecacuanha. In another case of a strong European three operations for liver abscesses were performed within three months by a very experienced surgeon, a large new abscess being opened on the last occasion. The patient was still not doing well, when he was put on ipecacuanha, and the cavity washed out with quinine solution. His temperature rapidly fell to normal, and he began to pick up, eventually recovering completely without any further abscess formation, although the extensive wounds took several weeks to heal. These instances will suffice to confirm my opinion that ipecacuanha should never be omitted in the after-treatment of these cases.

DURATION AND METHOD OF TREATMENT.

Some important practical points in carrying out this treatment remain to be dealt with. In the earlier cases the drug was left off as soon as the temperature fell to normal, but one of the patients returned with a liver abscess several months later. For the last three years it has been usual to continue full doses of 20 to 30 grains once a day for one or two weeks after the temperature fell to normal, and in smaller doses for some time longer in the more acute cases. We have not yet had any relapses under this plan. Full doses are required, and as much as sixty grains at a time have been administered. I think, however, that the full effects can be got with half that amount, while in feeble patients or females twenty grains will usually suffice. In one case only five-grain doses were given by mistake, and a very acute hepatitis subsided completely, although much more slowly than is usual under fuller doses in other cases.

One reason why this valuable remedy has fallen into disrepute is doubtless the great unpleasantness attending its use in sufficient doses. The usual method is to give it as a powder some twenty minutes after a dose of tincture of opium, or better, twenty grains of chloral hydrate, no food or drink being given for several hours before and after, the patient being kept as quiet as possible and instructed to try not to vomit. By giving one large dose late in the evening he will often sleep through his troubles, while if he does not vomit until after three hours or more, but little of the drug will be lost. A method used with success in the Philippine Islands, and also recently in Calcutta, is to make fresh five-grain pills of ipecacuanha, and brush them over with a thick coating of melted salol, which does not readily dissolve in the stomach. A still better plan has been introduced by me in Calcutta with very favorable results: it is to put up the powdered drug in five-grain doses in keratinized capsules, which do not dissolve in the stomach, but carry the drug into the bowel, where its action is required. This method has done much to get over the objections to the treatment. How the ipecacuanha acts is unknown. That a solution of the drug in water has little or no action on the ameba is certain, so that it would appear to be altered in some way in the gastrointestinal canal or during absorption, for there is nothing more certain than the fact that it does exert a beneficial action in presuppurative amebic hepatitis and in certain types of dysentery in India which is little short of miraculous.

1. *British Medical Journal,* Sept. 20, 1902, and June 6, 1903.

2. *British Medical Journal,* Oct. 24, 1908, p. 1246.

3. *British Medical Journal,* June 16, 1906, p. 1397.

4. *Practitioner,* June, 1907, p. 776, and Fevers in the Tropics, p. 173.

THE USE OF OIL OF CLOVES (OLEUM CARYOPHYLLI) IN PULMONARY TUBERCULOSIS.

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There is a type of case in the moderately advanced and advanced stages of pulmonary tuberculosis, when cavity formation has occurred, in which severe paroxysms of coughing and excessive amounts of sputum are the most prominent symptoms. Indirectly there results from these symptoms marked loss of weight and exhaustion because of the severity of the cough, which not only keeps the patient awake at night, but frequently leads to attacks of vomiting. In some instances, while the coughing attacks are not marked the patient is constantly awakened by having to expectorate large quantities of sputum.

It is in cases of this type that creosote and its congeners, or opium in one form or another, are so frequently employed, and it must be confessed, with but indifferent results.

The tuberculosis wards of the Philadelphia General Hospital contain for the most part cases of advanced phthisis, and in a not inconsiderable number of these hopelessly diseased patients the cough and excessive expectoration are the symptoms demanding the most attention. Having failed to relieve many of these patients with the stock prescriptions in common use, we were led to try the effects of oil of cloves.

Oil of cloves has a limited therapeutic field, and its use in pulmonary tuberculosis is but little known. For some years past Dr. H. A. Hare in his lectures and in his Text-book of Practical Therapeutics has referred to the drug as being of service in tuberculosis, administered either hypodermically or by mouth. As the hypodermic use of the drug is somewhat painful we limited our use of it to the internal method.

Cases presenting the following symptoms were selected: The patients had severe paroxysms of coughing, which finally ended in the expectoration of large quantities of thick, lumpy, greenish-yellow sputum. The amount of sputum varied in different cases between one and a half and four sputum boxfuls in twenty-four hours. These cases, without exception, had been treated with various cough mixtures, and in some instances large doses of codeine or morphine had been employed, without giving relief.

In carrying out these clinical experiments every effort was made to avoid the effect of mental suggestion, a fact of considerable importance in dealing with tuberculous individuals. The nurse was first instructed to record the frequency of the paroxysms of coughing, and more particularly the amount of sputum brought up in twenty-four hours. If considered suitable the patient was given oil of cloves without advising him either of the change in the medicine or of any possible effect that might follow its use. The statements of the patients were always compared with the observations of the nurse as to the abatement of the cough and reduction in the amount of the sputum.

In those instances in which the drug acted favorably the cough abated in severity and frequency and the amount of sputum was greatly reduced, in some instances from three or four boxfuls to one or half a boxful in the twenty-four hours. In addition the character of the sputum changed, becoming less lumpy in appearance and more like ordinary saliva. The sputum was furthermore expectorated with little or no difficulty. In a few instances there was a general improvement in the

condition of the patients, which must be largely ascribed to their obtaining more sleep and retaining their food, rather than to any direct effect of the oil of cloves. It must be borne in mind, however, that a slight degree of gastritis and deficient gastric secretion are not unusual in the advanced stages of phthisis, and the improvement in the appetite may have been due directly to the oil of cloves, as it has a distinct stimulant effect on the gastric mucous membrane.

In addition to the tuberculous cases, one case of bronchiectasis of five years' standing was greatly benefited by the oil of cloves. This patient had two or three paroxysms of coughing daily, followed by the expectoration of a large quantity of horribly fetid sputum. The paroxysms of coughing were lessened in severity, and the amount expectorated was not only diminished in quantity but of a less fetid odor.

The success obtained in cases of this type led to the employment of the drug in patients having a severe cough, but in whom the amount of sputum expectorated was not a marked feature. The results in these cases were uniformly bad. The cough became tighter and the patients complained of a feeling of constriction across the chest.

The untoward effects noted in patients who took the drug with good results were of a trivial nature. Nearly all complained of a slight burning sensation in the mouth and the esophagus after taking the drug. This as a rule lasted but a few minutes, and in a day or two disappeared entirely. Two patients were unable to take the drug, as it was almost immediately rejected by the stomach.

Of the fifty cases in which we have employed the drug, thirty had a severe cough and expectorated large quantities of sputum, while in the remaining twenty the amount of sputum was slight and the cough for the most part was unproductive. Twenty-four of the thirty patients with large amounts of sputum were distinctly benefited. As has been already stated, those with an unproductive cough were not helped and as a rule were made worse by the drug.

Given internally the oil of cloves may be administered in the dose of from 3 to 5 minims in half a glass of milk or in capsules. A number of combinations were tried in the attempt to obtain a pleasing pharmaceutical preparation, but we did not succeed in getting anything better than the following:

℞ Olei caryophylli,
Syrupi senega, ää f℥ij;
Ext. glycyrrhizæ fl., f℥iss;
Aquæ destillatæ, q. s. ad f℥iij.

M. Sig.: Teaspoonful three times daily after meals.

The drug may also be administered hypodermically, once daily, in the dose of five minims to thirty minims of pure olive oil.

The internal administration may be continued for from ten days to three weeks. If, however, no benefit results in ten days its use had best be abandoned. Even in those cases in which the oil of cloves is taken with a good effect it seems advisable to discontinue its use at the end of two or three weeks. If the expectoration again increases the drug may be resumed.

The interesting question of how the drug acts in these cases cannot be answered satisfactorily. While the relief given to the cough might be attributed to the anesthetic action of the drug in the upper air-passages, it is to be noted that the same effect is produced when the drug is given hypodermically. Furthermore, an irritating cough unattended with much sputum, instead of being improved seems to be made worse. The abatement of the cough is probably simply secondary to the diminution in the quantity of sputum, which requires less effort for its removal. Inasmuch as no ill effects follow the diminished secretion the oil of cloves probably has an inhibitory action on the secreting membrane of the cavities rather than causing a locking up of the material, as does opium.

APOMORPHINE AS A HYPNOTIC.

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Apomorphine is one of the most peculiar and interesting remedies known to modern medicine. It is comparable to no other drug. It is *sui generis*. Although derived from morphine it has none of the therapeutic properties of that remedy. It is an emetic, and also the most prompt and vigorous of all the hypnotics. Yet it is unlike any other emetic, and its hypnotic action is totally different from that of any other hypnotic. It has always been known as an efficient emetic, but its hypnotic properties were unknown until I published my first paper on the subject in 1899. The year before the publication of this paper a standard materia medica said: "It (apomorphine) is neither hypnotic nor narcotic in any degree." In the edition following the appearance of my paper this statement was corrected, and due credit given to me.

The peculiarities of this drug have led to the publication of other inaccurate statements. The last edition of an otherwise excellent materia medica has this remarkable explanation to offer regarding apomorphine: "Its continuous use is sometimes followed by a soporific effect, which is no doubt due to the contamination of the preparation with traces of unconverted morphine." It would be difficult to compress into one sentence more misinformation on this subject. Its "continuous use" not only produces no soporific effect, but results in a peculiar tolerance, so that even large doses are followed by no effects whatever, either emetic or soporific. As the hypnotic dose of apomorphine averages only one-thirtieth of a grain, any "traces of unconverted morphine" that it might contain would be so infinitesimal in quantity as to be inert. Even if the entire dose (gr. 1/30) were morphine it could produce no "soporific effect." These quotations from standard materia medicas show what little study has been given to this important drug, and how slightly understood is its wonderful hypnotic action. This lack of interest and accurate investigation of so valuable a remedy is unaccountable. In a communication to the *Canadian Practitioner* for October, 1908, Dr. A. M. Rosebrugh, Secretary of the Ontario Society, says: "Please allow me to call attention to the discovery that apomorphine hydrochloride, when administered hypodermically in doses just short of the emetic dose, is an ideal hypnotic. . . . This valuable discovery was made by Dr. C. J. Douglas, of Dorchester, Mass., in 1899, but, strangely enough, the discovery remains almost unknown, and the boon therefore has not been taken advantage of as it doubtless will be when this important property of apomorphine becomes fully realized."

In the papers that I first published on this subject I gave one-thirtieth of a grain hypodermically as the average hypnotic dose of apomorphine, and all the text-books that have since referred to this property of the drug have quoted this figure. But it should be remembered that this is not a fixed amount. Individual susceptibility to the action of apomorphine varies somewhat. If it is desired to avoid nausea the dose must be as near to the emetic dose as possible without quite reaching it. If it is a little too small it produces no effect whatever, even if repeatedly administered every thirty minutes, as it has no cumulative action. On the other hand, if the dose is a little too large it produces emesis. We must sail between this Scylla and Charybdis if we would attain the ideal result of profound sleep without nausea. I have seen the wildest alcoholic delirium yield to this remedy, and the patient fall into a restful sleep within twenty minutes after the hypodermic administration of apomorphine. In such cases it is not important that nausea be avoided, as emptying the stomach does no harm. If this remedy is to be frequently exhibited the dose must be gradually increased, as toleration soon develops.

Since 1899 I have been continuously

using apomorphine in my sanatorium work for hypnotic purposes, and have found that in promptness and certainty of action it has no equal. It shuts off the "stream of consciousness" with valve-like precision. While there are few infallible remedies, and this one may occasionally fail, yet among the hypnotics I know of none that is so certain in its effects. Its safety is another advantage. As one-tenth of a grain is universally considered a safe emetic dose, the hypnotic dose of one-thirtieth of a grain must be absolutely devoid of danger. It is prompt and safe and sure.

SOME FACTS AS TO CHLOROFORM AND DELAYED CHLOROFORM POISONING.

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As soon as the fact was definitely established that chloroform was able without fail to cause loss of consciousness, discussion as to the mechanism of its action and as to the exact amount required became rife. Owing to its being given by inhalation and being excreted in the expired air almost as rapidly as absorbed, the latter of these questions presented difficulties not encountered with most drugs. The first experimental work was undertaken by Snow, who enclosed animals in air-tight cages containing known percentages of chloroform (he determined that 1 grain of chloroform formed about 1 cubic inch of vapor at ordinary temperatures, and his percentages mean 1 grain to 100 cubic inches of air). He found that 2 per cent was able to cause insensibility in any animal without danger to life; that 1 per cent was uncertain and 3 per cent dangerous. His calculations as to the amount absorbed by the animal were inaccurate. Anstie confirmed his results. Burton found that 2 per cent was required to establish insensibility in man and 1 per cent to continue it, but his experiments are too few to be conclusive. Tissot proved that the percentage inspired necessary to produce anesthesia varied according to the depth of the respiration. Performing artificial respiration on animals, he found that with very deep breathing 0.8 per cent was enough, while the insensibility produced by deep breathing of 1.2 per cent passed off if ordinary breathing was resumed; 1.6 per cent did not cause insensibility with ordinary but killed with very deep breathing. Dreser found rabbits more susceptible, a volume percentage of vapor of 1.63, 1.45, and 1.20 causing death in from 75 to 150 minutes; from 1.1 to 0.9 per cent caused insensibility without danger; while less than 0.8 per cent was ineffectual. (Dreser and Tissot use a percentage by weight which is somewhat stronger.)

Attempts were also made to determine the requisite amount by ingestion and injection. Thus Anstie found that intraperitoneally injected, enormous amounts did not cause death; a cat injected with 30 minims was insensible at the end of ten minutes and had completely recovered in ninety minutes. As this amount is far above that required by inhalation, being about ½ per cent of the blood, we must conclude that elimination is almost as fast as absorption. Other animals withstood similar amounts in proportion to their weight: thus he found subcutaneous injection of 45 minims necessary in man, whereas Simpson produced insensibility with from 18 to 24 minims inhaled.

The results of determinations of chloroform in the air inspired and expired have been inconclusive. Buckmaster and Gardner found that elimination begins almost simultaneously with inhalation, and that absorption gradually lessens, the elimination lessening in proportion. Vernon Harcourt found in man that more than half of that inhaled was exhaled from the outset and the proportion exhaled steadily increased, although it never quite equaled that inhaled. The results of different experiments showed wide variations. As a

rule about two-thirds of the vapor was exhaled after insensibility had been established. Brodie and Widdows, working with cats, found that the greater the percentage of vapor in the air inhaled, the greater was the proportion exhaled, so that the amount retained did not increase as rapidly as the concentration. The amount retained was greater the deeper the respiration, and this had more influence than the percentage inhaled. Their results showed at the end of ten minutes, with 1.64 per cent vapor, 0.17 gramme retained; with 1.80 per cent, 0.15 gramme; with 2 per cent, 0.275 gramme; with 2.30 per cent, 0.275 gramme; and with 2.78 per cent, 0.35 gramme. Dodgson believed that if mice retained 1/10,000 of their body weight it proved fatal. This would mean .07 per cent in the blood, which would be fatal.

The methods of estimating the chloroform in the blood are still unsatisfactory. Various methods have been tried, but the only ones which are accurate are very tedious. Moore and Roaf have tried to show that the most accurate method is that of estimating the vapor pressure *in vacuo* after gases had been withdrawn. The method has not given accurate results in varying conditions, on account of the variable influence of indeterminate factors. By shaking up chloroform with deoxygenated blood *in vitro* accurate results are obtained, but not from blood drawn during life. The solubility of chloroform in blood they found to be 4.42 per cent. Buckmaster and Gardner attempted to show the amount of chloroform in the blood by making total chlorine determinations of blood before and after administration. The chloroform chlorine is such a small part of the total chlorine content of the blood that the method is inaccurate in the extreme. The authors admit its inaccuracy in a later article. Most authors have determined the chloroform by drawing air through the blood and burning the chloroform vapor which this carried, and estimating the chlorides thus formed. Pohl obtained very accurate results by this method, the air on leaving the warmed blood being drawn through a combustion tube containing magnesia heated to redness; the chloroform is burned to $MgCl_2$. He found that blood held the chloroform strongly and that it was necessary to draw air through for thirty-six hours to obtain complete results. Vernon Harcourt used this method modified by drawing the air through a tube containing a red-hot platinum wire which burns the chloroform to HCl, which is then estimated. His results were always incomplete because he did not draw the air through for a sufficiently long time. He never obtained more than 90 per cent of the amount, and generally not more than 80 per cent.

Recently Nicloux has devised a method which he describes as follows: "To the blood (or other organic liquid) is added five times its volume of alcohol with 1 to 400 tartaric acid to overcome any alkalinity. The whole is placed in a flask with a perforated cork stopper (not rubber) and distilled into a graduate containing 10 Cc. of 95-per-cent alcohol. The end of the distilling tube, drawn out into a point, plunges beneath the alcohol, which prevents loss by evaporation. The chloroform distils first, and the entire amount is always found in the first third of the distillate. The distillate is then transferred to a flask fitted with a reflux tube, and 10 Cc. of a 10-per-cent alcoholic solution of potassium hydrate is added. This is kept at the boiling point for forty-five minutes, then cooled on ice. The stopper is removed and 2 drops of a 3-per-cent solution of phenolphthalein is added, then 30-per-cent HNO_3 to slight acidity, and a pinch of $CaCO_3$ to neutralize excessive acid and make all neutral. Then 2 Cc. of a 5-per-cent solution of chlorate of potash is added and the solution is titrated with decinormal silver nitrate." His results were apparently very accurate.

The results obtained are as variable as the methods, but this variation is not due to loss after drawing the blood, as Dodgson has shown that there is no loss for at least seventy-two hours. Byles, Harcourt, and Horsley found that when blood and chloro-

form were mixed *in vitro,* the longer they stood before analyzing the harder the chloroform was to extract. After standing twenty-four hours only 80 per cent was obtained, but this was probably due to passing too little air through the mixture, as shown earlier by Pohl.

Pohl found in two dogs in narcosis in arterial blood respectively 0.015 per cent and 0.062 per cent, in the brain of the first .042 per cent, and in the liver of the second .044 per cent. In a dog killed by chloroform he found .043 per cent in the blood, which result lies between the others, and .036 per cent in the brain, which is less than in narcosis.

Tissot found that the amount in the blood was greater a few seconds before death than after respiration had ceased, as chloroform passed into the tissues and no new was taken up.

The results obtained from a small amount of blood are not accurate because blood from various sources shows varying percentages. Venous blood contains less than arterial during induction of anesthesia and more during recovery, for obvious reasons. He found that the amount of chloroform in the blood at the moment of insensibility was directly proportional to that present in the air inspired. If anesthesia was produced in two to three minutes the blood showed 0.06 to 0.07 per cent; if in five to eight minutes, 0.044 per cent; if very slowly, only 0.035 per cent. Lallemand found 0.066 per cent after death; Grehant and Quinquand 0.05 per cent in narcosis; Nicloux 0.054 to 0.057 per cent in narcosis and 0.064 to 0.07 per cent after death. Harcourt found in three dogs in narcosis respectively, 0.0177 per cent, 0.042 per cent, and 0.035 per cent, and after death in one dog 0.031 per cent.

Wells found in a series of dogs in narcosis, average 0.016 per cent, maximum 0.0337 per cent, minimum 0.0057 per cent; after death, average 0.021 per cent, maximum 0.087 per cent, minimum 0.013 per cent—the minimum fatal amount being below the narcotic average and the maximum narcotic half again as much as the average fatal. In three men after death Wells found 0.004, 0.004, and 0.0024 per cent. Buckmaster and Gardner found in cats that the percentage of chloroform in the blood during narcosis varied from 0.014 to 0.0276, while after death it averaged 0.040 per cent; in two dogs, in narcosis 0.016 and 0.031 per cent, and after death 0.061 and 0.069 per cent. With very few exceptions these results lie between the extremes of 0.015 and 0.060 per cent for narcosis, and (omitting those in man) between 0.025 and 0.070 after death. The fatal results in the three men would seem not to be from overdose, as only about one-tenth of this amount was found.

Sherrington and Sowton attempted to show how strong a percentage of chloroform in the blood would prove fatal, by determining how strong a solution would stop the isolated heart of the cat in a perfusion experiment. Their work showed that with defibrinated cat's blood 0.1 per cent would stop the heart and 0.075 reduce it to one-fourth of its normal beat. Any percentage higher than 0.035 influenced its action markedly. While 0.05 per cent was flowing, stimulation of the vagus would stop the heart permanently unless the sympathetic were stimulated, which would start it again. If saline solutions were used instead of blood, as little as 0.015 would stop the heart and 0.005 per cent reduce its beat to one-fourth of its previous force. It was noteworthy that the maximum effect was quickly reached and did not increase after ninety seconds if the percentage remained the same. The rate of the beats was not much affected, the action being almost entirely on their force. The effect was increased by the presence of CO_2 instead of pure oxygen in the perfusion fluid. This is interesting in view of Tissot's observation that clinically CO_2 has a bad influence and that as a result of shallow breathing it tends to collect, although chloroform does not lessen the power of the blood to absorb oxygen. The heart of a gorilla and of a chimpanzee showed greater resistance than

that of the cat, and similar experiments with voluntary muscle showed that it was affected in the same way as the heart, but less markedly.

The question of how the chloroform is carried in the blood was first solved by Pohl, who showed that the solvent power of serum was much greater than that of saline or water, and that of blood greater than that of serum. Separation of the blood cells and plasma showed that about three-quarters of the chloroform was carried by the cells. A solution of hemoglobin showed no great solvent power, but a solution of the ethereal extract of the cells, consisting mainly of lecithin and cholesterin, showed such great solvent power that it explained the peculiar distribution of the chloroform very readily. Pohl showed that the amount of chloroform in the various tissues was in proportion to their blood supply and their fat content. Adipose tissue on account of its poor blood supply contains very little, but the brain and liver a great deal. Brain tissue ground up and dialyzed with water holding 0.6 per cent chloroform contained after twenty-one days 1.25 per cent. Lallemand's results confirm Pohl's, showing after death (with blood as the unit) chloroform in blood 1, muscle 0.16, brain 3.92, liver 2.08. Buckmaster and Gardner compared blood of chloroformed animals with that of etherized animals, and found that the corpuscles of the latter contained a larger percentage of chlorine. The actual amounts of chlorine were similar, but after chloroform the corpuscles formed a much smaller percentage of the total blood than after ether. Their deductions are therefore not justified. Moore and Roaf have shown that after 2 per cent of chloroform has been taken up by the blood *in vitro*, further addition does not depress the freezing-point, showing that no more is held in aqueous solution, but all in some other way.

Secondary Chloroform Poisoning.—Although this terrible sequel of anesthesia was described by Casper in 1850, no adequate studies of it have been made until recently. Guthrie reported several cases and discussed the condition at length in 1895, and since then a large number of cases have been reported, almost all ending fatally. The condition is one of acidosis and is characterized by the excretion of acetone and diacetic acid. Clinically the cases tend to fall into two groups, one resembling diabetic coma, the other acute yellow atrophy of the liver. The first type is almost always seen in children and begins ten to one hundred hours after the anesthesia, recovery from which has been normal. The first sign is usually a wild terror with loud screaming, after which the child sinks into lethargy and the odor of acetone is noted on the breath. Screaming spells follow and air-hunger shows itself. Vomiting of sour matter smelling of acetone is frequent. Soon coma supervenes, and death follows in a day or so. The urine shows varying amounts of acetone, diacetic and oxybutyric acids, but no other abnormality. At autopsy a varying degree of fatty degeneration of all the organs is found, especially the liver, heart, kidneys, and walls of the stomach. In Bevan and Favill's case there was very little fatty change in any of the organs.

The second type begins under similar circumstances, with vomiting of sour matter, which soon changes to a brown fluid, like dregs of beef tea or coffee. Jaundice rapidly follows and the breath smells of acetone. Air-hunger and distress and unrest succeed, and finally pass into fatal coma. The urine shows large amounts of bile pigment, but less acetone than in the other type. Autopsy shows marked fatty change everywhere; the kidneys are inflamed and may show tiny areas of necrosis. The liver is changed into a homogeneous mass of bright-yellow fat, the lines between the lobules are lost, the findings being practically those of acute yellow atrophy. Almost all the cases in adults have been of this type. The case studied by Wells was of this type, as were the cases of Campbell, Bandler, Heintz, Stiles, and McDonald.

It has been shown that after either chloroform or ether anesthesia, acetone is very likely to appear in the urine. Becker, in 251

cases, found it in 167; Beesly found it almost always in children; Kelly in 400 cases found symptoms of acidosis in 46. Brackett, Stone and Low found acetone in 11 of 300 surgical cases before operation. The frequency of acetonuria is indirectly confirmed by animal experiments, which show that administration of chloroform is always followed by fatty changes in the viscera. Nothnagel, Ostertag, Strassmann, Bandler, Offergeld, and Miller report detailed studies of the lesions found in various animals, and all agree in the main.

Detailed chemical studies have been reported by Reicher and by Wells. Reicher studied the excretion of acetone and diacetic acid, and also the ammonia and total nitrogen in dogs after anesthesia, and found that the ammonia nitrogen was somewhat increased, and the acetone enormously, after chloroform or ether, and less after morphine or alcohol had been given. He collected the acetone on the breath as well as in the urine, and found that from two-thirds to nine-tenths of the total output was passed through the lungs. This explains the uncertain results obtained by quantitative studies of acetone in the urine. Reicher also studied the lecithin, cholesterin, and fat content of the blood, and found that after chloroform and ether given once in large amount, these were increased in proportion and were from three to four times as large as normal; after alcohol and morphine they were two to three times as large as normal. Wells studied the composition of the liver in a case of the yellow atrophy type in man after chloroform and found that there is a rapid autolysis, resulting in a loss of as much as one-third of the solids in three or four days, and indicated by the presence of products of proteid digestion. The fat was somewhat increased, the cholesterin and lecithin not increased.

Delayed chloroform poisoning is most likely to occur in diabetics and in severe cases of prolonged malnutrition. Liver diseases and fatty degeneration in any part of the body also predispose to it, as do anemia and starvation. The fatty change produced by a previous anesthesia makes a second one very dangerous, and Offergeld and Miller both warn against giving chloroform for examination prior to operation, and using it within a few days as the anesthetic for the operation itself. That such factors predispose is easily understood when we consider the physiology of the condition, which has been summarized recently in a masterly article by Hunter. He shows that chloroform interferes markedly with the power of the liver to assimilate proteids. This leads, on the one hand, to a lessened supply of ammonia, and on the other to loss of energy. The latter is made up by increased combustion of glycogen, and when this is exhausted the fats are called on. Fats are brought from all over the body to the liver and there burned to keep up the body heat and energy. Among the products of their combustion are the lower fatty acids, oxybutyric and diacetic, and the increase of these, with the lessening of ammonia, leads to acidosis. The increased amount of lipolytic ferment necessary to hold this fat in the blood may act on the liver itself and cause the symptoms of acute yellow atrophy. It has been shown that the lipoids of the blood are markedly increased during chloroform narcosis, and it is possible that this increase is a protective measure, increasing the power of the blood to fix the anesthetic and thereby lessening the amount given off by it to the nervous centers.

Delayed chloroform poisoning may be avoided by seeing to it that the patient, before operation, has a sufficient store of glycogen. A meal consisting of starches and sugar should be given about two hours before beginning the anesthesia. This will give the stomach time to empty itself. Glucose should be given to the patient as soon as the recovery from the anesthetic is complete. The usual habit of starving the patient for almost a day before and underfeeding him for some days after anesthesia

is a fruitful cause of trouble, as Hunter has shown. If the symptoms of acidosis occur, large amounts of glucose should be given by rectum or hypodermoclysis, with small amounts of sodium bicarbonate. If given by the mouth they will also tend to stop vomiting, but the other routes should be used also. Beddard suggests intravenous injections of a solution of dextrose, if the case is urgent.

CUGUILLERE'S SERUM IN THE TREATMENT OF BONE TUBERCULOSIS.

BY CHAS. H. MUSCHLITZ, M.D.,

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The very successful and gratifying results that have been recorded by several authors in the cure of pulmonary and bone tuberculosis by the use of Cuguillere's serum deserve scrutinizing attention. Within the past decade various sera have been used, but none has answered the demand specific. E. Cuguillere says: "For almost seven years, under diverse circumstances, many of you have heard me raise my voice and proclaim the perfect curability of tuberculosis by a method which is original with me." Eugene Caravia, in a recent article, says: "To be sure, many persons with pulmonary tuberculosis have been cured and are being cured with other drugs and sun and air, and some have been cured without the help of any treatment, but with Cuguillere's serum the recovery is almost mathematically certain provided the organism has sufficient vitality and recuperative powers, and has not fallen into decay." With such claims in hand the author felt justified in using the serum on a small number of cases of bone tuberculosis, the reports of which will follow.

According to Cuguillere's writings, it will be found that the principles of his vegetable serum were founded on the writings of Koch, who, after discovering the organism, wanted to not only destroy or attenuate it in cultures or kill it *in vitro*, but also to obtain the same effects in the animal and human organism. Cuguillere believes that a serum can be made to carry colloidal metals already assimilated that have become organic, living and possessed of their maximum activity. It is the mineral and vegetable kingdoms that furnish the active principle of his serum, which is organic sulphur, taken from fresh juices of brassica, allium, watercress, horseradish, and other herbs. The method of preparation has thus far been unobtainable by the author, but the composition as given by Cuguillere in the Tuberculosis Congress in Paris in 1905 is as follows:

Allylum sulphide, 1 gramme;
Tincture of myrrh, 1 gramme;
Hayem's glycerinated serum, 100 grammes.

The physiological action as given by Cuguillere in 1905 is as follows:

1. "It is not toxic; the maximum useful dose for an adult is 15 Cc., and tuberculous guinea-pigs withstand a dose of 5 to 6 Cc. without the least inconvenience.

2. "It disseminates throughout the organism with remarkable rapidity. In thirty seconds at least the patient exhales from the lungs the characteristic odor of the essence of myrrh and the sulphuret of garlic.

3. "There is a remarkable action on the fever, and it is upon the temperature curve more than upon the stethoscopic signs that I rely as a basis for the direction of the treatment of pulmonary tuberculosis.

"The evening increase in the temperature owing to the injection and the reaction never exceeds five-tenths of a degree. In coxalgia it is unnecessary to make injections at the point of pain, except in the cases in which sciatica is intense, in which cases make injections freely over the great trochanter, at least 5 Cc. For white tumors of the knee and the elbow, in a faulty posi-

tion, I have obtained correction slowly and progressively by a dressing over the articulation held by a pressure screw. In Pott's disease, on the contrary, I would recommend immobilization in good position. In ovaritis, orchitis, salpingitis of a tuberculous nature, no special precautions need be taken, and patients may be allowed to continue their ordinary occupations."

In reply to a communication, the *Journal of the American Medical Association* of December 5, 1908, writes regarding the serum, the following being excerpts:

"It appears, therefore, to be no serum at all, because the 'serum' component is merely Hayem's fluid or artificial serum, the formula of which is usually given as mercuric chloride 0.5, sodium sulphate 5, distilled water 200, with an addition of glycerin. The two other components are the 'active' ones, according to Dr. Cuguillere, who has a strong belief in the 'extraordinary power of garlic and the ethereal oils containing organic sulphur.' Allylum sulphide $(C_3H_5)S$ is the principal component of the ethereal oil of *Allium sativum,* and like the latter (garlic) has had some reputation as a remedy for tuberculosis. Regions in which much garlic is consumed, such as Galicia, are reported comparatively free from tuberculosis; and R. Koch has also experimentally demonstrated that the bacillus is little resistant against the various aromatic substances, especially the oil of garlic and the allied oil of mustard. Therefore, the formula given cannot indicate the true composition of this 'serum.'"

The preparation is a light yellow fluid about the consistency of simple syrup, having a strong odor of garlic, and produces a burning sensation when injected into the skin. It is carried in small sterile tubes of about 5 Cc. capacity. The method of administration as employed by the author is as follows: The Luer glass syringe is used; after breaking both ends of the tube containing the serum, it is dropped into the cylinder of the syringe and with a large hypodermic needle is injected near the site of the lesion. The dosage ranges from 2 Cc. minimum to 15 Cc. maximum.

It may be of interest to review several cases of bovine tuberculosis, reported by Dr. V. S. Faure, with complete autopsy findings:

A cow, eight years old, suffered from pulmonary and glandular tuberculosis, the diagnosis being confirmed by tuberculin injections. After weekly injections of from 20 to 50 Cc. for six weeks the tuberculin reaction was negative. Mesenteric glands normal. Notable general improvement. Injections continued three months longer. Gain in weight 75 kilogrammes. Animal seemed cured. Autopsy: Sublingual and bronchial glands normal. Mesenteric glands showed evident traces of cured tuberculous lesions; lungs contained some slight foci of pneumonia. Parietal pleura showed remnants of pleurisy with here and there some filaments.

The second cow presented a tuberculous fistula near parotid gland, and enlarged sublingual, prepectoral, and superficial glands, and also in the abdominal wall. Pulmonary involvement and general condition bad. Tuberculin reaction positive. Treated by Cuguillere's serum weekly for three months (10 to 80 Cc.). Autopsy showed evidence of lymphatic, pulmonary, pleural, hepatic, and splenic involvement with signs of healing. The fistula was reduced to a simple fibrous string.

Similar cases were reported, and the autopsies always revealed the same curative changes in more or less advanced degrees of the healing process. Dr. Faure states that after three or four injections the general condition is changed completely, and the changes are more notable when the animal is in a more advanced degree of tuberculosis.

The cases of human tuberculosis of the surgical type treated by this serum were first furnished by Dr. Cuguillere in 1903:

Case 1.—Tuberculosis of the tarsus from the age of six until the age of twenty-five. After twelve weekly injections, spontaneous elimination of tarsal necrosed bones. A

season at the seaside activates the recovery maintained for the last four years. Foot composed of the calcaneum and metatarsal bones. Complete mobility of the fibrous articulation.

Case 2.—Osteoperiostitis of the tibia. Miss L. L. Disease unyielding to seaside treatment. Recovery after six injections of serum. Later a season at the seaside.

Case 3.—Miss L.; coxalgia. Impossible to produce ankylosis, unyielding to seaside treatment. After six injections patient walks with the help of a light cane. Followed by another course of thalassotherapy. Cuguillere never employs absolute immobilization; moderate exercise with massage and injections of his serum brings about the complete resorption of fungosities.

Case 4.—Miss L. Y.; caries of the ribs. Recovery after five injections. Thalassotherapy after.

Case 5.—Mr. M.; osteoarthritis of the right knee; suppuration four years. Six seasons at Balaruc without effect. After twelve injections and one month's stay at Balaruc, recovery. Existing ankylosis previous to injections, partially relieved.

Case 6.—Tuberculous pleurisy. Miss B. C. Costal abscess open in pleura and externally. Pleural cavity containing 150 Cc. of fluid. Seaside treatment without effect. Resection proposed; instead the serum was used to wash the cavity eight times. Fibrous adhesions formed. Recovery maintained after short season at the seaside, and confirmed by radiography three months later.

Caravia reports a number of cases, which briefly are as follows:

Case 1.—White swelling of left knee of eighteen months' duration. Incision and curetting had been performed. Treatment, 4 to 5 Cc. of serum weekly. A little more than three months after this swelling had materially subsided, and she was able to walk without a cane six weeks after treatment closed.

Case 2.—Tumor of breast, tuberculous in nature. Eight injections reduced tumor in size to 1½ inches vertically and 1¼ inches transversely. No pain.

Cases 3 and 4.—Pulmonary tuberculosis. Died.

Case 5.—Pulmonary tuberculosis. One lung partially involved after seven months of uninterrupted treatment with 3 to 5 Cc. No bacilli present in sputum at last examination.

Case 6.—Pulmonary tuberculosis. Left lung partially involved. Tuberculosis present in sputum. Treatment for nine weeks, and tubercle bacilli are still present in sputum. A few deep râles can be heard. General condition excellent.

Dr. Escoyez has used the serum on a large number of cases of pulmonary tuberculosis and offers a very large percentage of cures. Dr. Caravia writes as follows about the statistics:

"At the International Congress of Tuberculosis (Paris, 1905) and at the International Congress of Medicine (Lisbon, 1906) Dr. Escoyez reported the histories of forty cases of pulmonary tuberculosis treated with Cuguillere's serum. Since then he has treated 107 additional cases, making a total of 147. Seventy-one of these cases could not be considered because they died from other causes; 15 because they did not continue treatment, and 54 because, on account of their advanced condition, they received inoperative doses as an encouragement only. Of the remaining 76 at the time this summary was prepared 41 were radically cured; 14 were probably cured (general and local conditions excellent, but rare bacilliferous expectoration due to the incomplete collapse of the affected portion of the lungs), 6 markedly improved, 3 improved, 3 were stationary or progressive, and 8 died. The deaths were due to complications like peritonitis, grippe, and cardiac affections. With the radically cured the percentage was 53.8, and if we add the 14 practically cured, the 6 greatly improved, and the 3 improved, we have a total of 64 successful cases, or a percentage of 84.2."

There evidently is a typographical error in the above statement, and therefore, for the present at least, the percentage of cases cannot be considered as a correct one.

The author's cases were patients at the Orthopedic Department of the Philadelphia Hospital in the service of Dr. H. Augustus Wilson, through whose courtesy and permission the administrations were made.

Case 1.—J. C., aged fifty, colored. Tuberculosis of right hip. Duration about ten months. Leg much atrophied, in a position of flexion, adduction, and internal rotation; shortening about one inch; one sinus discharging seropurulent material just posterior to great trochanter. Has much pain night and day and can scarcely move the limb. Also has a tuberculous dactylitis of left index-finger and slight pulmonary involvement. Is fairly well developed, with firm musculature. Considerable loss of weight since onset. Cannot walk. Has been bedridden for four months. Treatment started November 1, 1908, by 2½ Cc. injections, and after that for five weeks 3 Cc. was administered. Pain less severe after first injection, and is able to stand without pain. After fourth injection patient lost weight. After sixth injection discharge is very slight and of bloody serous nature. Injections made in upper part of thigh anteriorly. During the remaining eight weeks 5 Cc. was injected weekly, with fluctuations in the condition of the patient and amount of discharge from the sinus. At the termination of the treatment, February 1, patient had grown very much emaciated and was scarcely able to stand, and the discharge was about the same as it had been for the past four weeks. The dactylitis showed no change. There was much burning after the injection. The temperature was not affected by the serum either immediately after or during the course of treatment.

Case 2.—J. P., white, aged fifty-five. Tuberculosis of spine. Patient walks about without support to the spine. Eats and sleeps well. Evidence of arteriosclerosis. Presents a rounded kyphus about middorsal region, with pain in this region. Some tenderness. There is a discharging sinus in the right lumbar region. Treatment started November 1, 1908, by 2½ Cc. injection, and after that for five weeks 3 Cc. was administered. After the third injection there was evidence of a decrease in the discharge from the sinus and the pain was less marked. After the fifth injection the discharge scarcely stained the dressing in twenty-four hours. During the following eight weeks 5 Cc. was injected weekly, the discharge increasing slightly and the pain present at times. Patient is losing weight and has a marked hectic flush. Temperature, pulse, and respiration were not affected by serum, as same varied less than one degree above normal at all times.

Case 3.—C. M., white, female, aged thirty. Tuberculosis of the spine; duration four years. She is a highly neurotic individual of small stature, whose general condition is fairly good. Eats and sleeps well. Complains of pain in lower part of the back. There is a rounded kyphus in lower dorsal region of the spine, and a discharging sinus in the right lumbar region, the result of a former operation for an existing abscess. The discharge is a typical tuberculosis material. Prior to the institution of the serum treatment she had worn a cast, which materially improved her condition while under our care. This, however, was removed, as its efficiency seemed lost, and ankylosis of the diseased part seemed firm. There was a mild degree of lung involvement. First injection of 2 Cc., November 1, 1908, was continued weekly for five weeks. After this time weekly injections were made of 5 Cc. for eight weeks. After the second injection the discharge seemed somewhat less and pain was not as marked. After the third injection patient was much nauseated and suffered headache for about six hours. No alteration in the temperature at this time. After the ninth injection an abscess developed near the sinus, probably as a result of infection; this was evacuated, and cleared up within a week. No change in the sinus discharge at the time the injections were stopped. Patient's temperature ran somewhat higher, between 100° and 101° in the afternoon. She lost some weight and her nervous state was aggrava-

ted rather than improved. Urine examination after the fourteenth week showed the presence of the tubercle bacilli, with a sinus freely discharging the seropurulent material.

Case 4.—M. O., white, female, aged eleven. Tuberculosis of the right hip; duration three years. She is a small girl, rather robust, unable to walk, but rides about in a wheel-chair. Eats and sleeps well. Right hip is in a position of flexion, adduction, and internal rotation. Much shortening and a pathological dislocation is present. There are three discharging sinuses about the hip-joint which require frequent dressing. She has been operated upon several times, but improvement failed to follow. The temperature showed the usual afternoon rise. Injections were started November 11, 1908, with 2 Cc., and followed by weekly injections of 2 Cc. for two weeks more, after which 5 Cc. was injected weekly for eight weeks, this patient having eleven injections in all. She usually had a rise of temperature shortly after the injection. After the third injection there was very little discharge and her general condition seemed normal. One sinus almost closed. The remainder of the time there were fluctuations in the quantity of discharge, and at the cessation of the serum treatment the discharge was no less than it was at the beginning. She was still unable to walk, though the joint was firmly ankylosed.

Case 5.—G. F., white, aged fifty-two. Tuberculosis of the right knee; duration 7½ months. Patient is much emaciated and mentally much confused, so that history is unreliable. Is unable to walk. Right knee is much swollen and painful. Tenderness over inner aspect of the joint at condyle. He coughs considerably and has pulmonary involvement. First injection of 2½ Cc. administered November 1, 1908, and when seen one week later the patient was in a moribund state and suffering with meningitis, probably of the tuberculous type. He died several days later, and an autopsy was performed. The pathological diagnosis was as follows: Left pleura, adhesions; right pleura, few adhesions. Miliary tuberculosis of both lungs, with ulcerations at both apices. Cloudy swelling of the myocardium. Miliary tuberculosis of both kidneys. Ulcerative tuberculosis of the intestines. Tuberculosis of lacteals and thoracic duct. Tuberculous infiltration of spinal meninges.

Case 6.—S. P., white, aged twelve. Tuberculosis of spine with osteoperiostitis of the right femur. Slight pulmonary involvement. Duration eleven months. A fairly developed and well-nourished boy with a high dorsal kyphus and a discharging sinus about the middle of the right thigh on the outer aspect. Has worn a brace 2½ months. Has no pain. Eats and sleeps well and is up and about, but walks with a rather guarded gait. There is evidence of oncoming Pott's paralysis. Treatment started December 7, 1908, by an injection of 4 Cc. into the right thigh near the sinus. Weekly injections thereafter of 5 Cc. for eight weeks. After the second injection the discharge seemed more profuse and patient complained of some abdominal pain, which was probably only gastrointestinal, as a purgative afforded relief. After the fifth injection the amount of discharge decreased somewhat, but the sinus required daily dressing. After the seventh injection paralysis became more apparent and patient had difficulty in walking about. After the ninth injection he could not walk without support and was confined in a chair most of the time. Discharge at this time was no less than at beginning of treatment. Spinal brace was used during entire course.

During the course of treatment blood examinations were made of Cases 1, 2, 3, 4, and 6 by the Rosenberger method, and the bacillus was found in all of them. Sputum was positive in Cases 1 and 6. Pus from sinus tracts showed the tubercle bacillus present in all. Examination of the feces was positive for the bacillus in Cases 1, 2, 3, and 6.

After February 1, when the serum treatmen was stopped, urine examinations were

made of the five cases under care, and all showed the presence of tubercle bacilli, this probably being evidence of elimination rather than disease of the genito-urinary tract. The serum caused no untoward effects save a burning sensation after the injection into the skin, which lasted from ten minutes to half an hour. In another case (patient 3) an abscess developed at the site of injection; this patient also became nauseated on one occasion, but this was coincidental, arising from another cause.

I wish to thank Dr. Eugene Caravia of New York for the serum which he so kindly supplied, and also for the deep interest he manifested during the course of treatment and for personal inspection of the patients. The bacteriologic work was performed by Dr. Randle C. Rosenberger and Dr. F. J. Kelty, to whom I feel indebted.

SUMMARY OF CASES: REMARKS.

It is quite evident after perusing the six histories aforementioned that the cases under treatment by this method were not incipient cases, but all were distinctly marked cases of bone tuberculosis. Three presented additional evidence of lung involvement. The condition of the patients at the cessation of the treatment was no better than before the first injection, and Cases 2 and 6 were materially worse. The number of injections ranged from eight to fourteen, and the amount from 2½ to 5 Cc. each dosage. The maximum dose in the adult was supposed to be 15 Cc. according to Cuguillere, though this amount was not administered to any of the above mentioned patients at one time. We might consider that these cases were of a rather severe type and not a fair test as to the value of the serum; but if the serum has any value, it would benefit the severe cases of tuberculosis even if it did not cure them. All the patients on whom the serum was used, save patient 5, who died ten days after the first injection, showed general improvement for the first few weeks, their appetite increasing and their discharges slightly decreasing. Temperature was not affected. These patients did not have the advantage of outdoor life, but had a diet of milk and eggs during the entire course. Neither traction nor braces were used excepting in Case 6. What then accounts for this temporary improvement? No doubt the serum acted as a tonic, increased their appetites, and in this manner temporarily improved their condition; besides, these patients were radiant at the idea of having something done for them, which no doubt changed their mental attitude. It would not be just to draw conclusions as to the real efficiency of this artificial serum, since five cases only have had the advantage of treatment in the author's hands; but it can be safely said that the serum is not a specific one, and its efficiency, if any, is due to the tonic influence of the garlic that it contains and not to any direct destructive power on the bacillus itself.

The almost miraculous results said to have been obtained by Cuguillere, Faure, and Caravia already quoted in the early part of this paper are in marked contrast to the results observed in the patients under the writer's observation. If this paper had been based upon the apparent improvement that was noticeable after the third or fourth injection, a very much more favorable presentation of the subject would have been possible. After from nine to fourteen weekly injections the failure to observe any material improvement in any of the patients seemed to indicate that a further continuance was not justifiable in the best interests of the patients.

There is no reason for doubting the accuracy of the published statements of Cuguillere, Faure, and Caravia already referred to, but we must realize that I have been unable to obtain confirmation of them in the experience of others (than those mentioned), or from personal observation. It would appear natural to expect that a remedial agent that had been successfully employed for nine years by Cuguillere would be extensively used by others, and yet few of the journals or text-books reveal any such evidence.

It may be of interest to mention that a number of communications to foreign surgeons and to American authorities, asking for information about Cuguillere's serum, have brought no favorable replies, most of the writers stating that they knew nothing about the serum.

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TREATMENT OF SYPHILIS BY ATOXYL

CHARMEIL, BERTIN, and POITEAU (*L'Echo Méd. du Nord,* Oct. 25, 1908) have used atoxyl in the treatment of numerous cases of syphilitic disease, and a paper on the above subject gives the results obtained by them. With regard to the physiological properties of atoxyl, the authors point out that the drug is eliminated by the skin and especially by the kidneys, and in some cases causes a transitory albuminuria. Elimination, however, is not always rapid, and, like mercury, the drug is liable to accumulate in the system. Koch, Hallopeau, etc., have shown that the drug possesses toxic properties, and its administration may cause headache, vertigo, deafness, fever, vesical tenesmus, retention of urine, and especially blindness. For these reasons it is prudent not to exceed 0.5 gramme as a dose, and not to repeat the dose oftener than every other day. Further, it is wise not to continue the drug for more than ten days, then to allow an interval of fourteen days to elapse before entering on another ten days of treatment. When given subcutaneously or injected into the muscles (the two common modes of administration) the drug gives rise to no local disturbance.

In many patients whom the authors have treated with atoxyl injections soon after the appearance of primary chancre they have found that secondary symptoms of syphilis have appeared late, but that the disease has ultimately pursued its usual course. Out of 30 patients presenting various syphilitic manifestations which were treated by atoxyl injections by the authors, in all the general health appeared markedly improved; this, as the authors admit, may possibly have been due to a better condition of life and better hygienic surroundings of the patients whilst in hospital. On the actual syphilitic manifestations atoxyl appeared to have a very slow effect, and primary chancres remained stationary for a long time, in spite of atoxyl treatment. With regard to secondary syphilitic lesions, the authors found that mucous patches rapidly disappeared under atoxyl injections, whilst in other cases of secondary syphilis not very favorable results have been obtained. In tertiary syphilis arrest, and even slight retrogression, of the lesions have been observed; but a complete disappearance of tertiary lesions has never been observed even after long-continued treatment with atoxyl.

In all cases in which atoxyl has had very little curative effect treatment by mercury has been carried out, with the result that all symptoms have rapidly disappeared. As a result of their experiences with the use of atoxyl in the treatment of syphilis, the authors conclude that mercury and iodide of potassium cannot be abandoned for atoxyl. They admit, however, that atoxyl has a certain curative effect, and that its employment may be of value in certain cases. However, in the authors' opinions, atoxyl will never become a specific for the treatment of syphilis; its effect in this disease is much inferior to that of mercury, and its toxic effects, especially on the visual apparatus, are greater than those which may result from mercurial treatment.—*British Medical Journal,* March 6, 1909.

EDITORIAL.

COMBATING INFECTION BY MEANS OF DRUGS.

Ever since the day when Lister brought forward antisepsis in surgery, medical clinicians have been striving to destroy microorganisms in the body by the administration of drugs which were known to possess more or less antiseptic or germicidal power. As we have often pointed out these efforts have failed, in almost every instance, because the protoplasm of man is much more susceptible to the influence of poisons than is the protoplasm of the invading microörganisms. Some years ago we had occasion to point out not only the futility but the danger of some of these methods when a New York physician advocated the injection of formaldehyde solution into the veins for the purpose of arresting bacteremia. This is perhaps the most noteworthy instance of radical therapeutic endeavor, based upon an inadequate conception of the underlying conditions that we have met with. It is true that we have found in quinine an agent which is capable of destroying the parasite which induces malarial fever without doing damage to the tissues of the host, and the discovery of the specific microörganism of syphilis provides, perhaps, another instance in that mercury is able to act deleteriously upon the protoplasm of the parasite of this disease without destroying the human being. A third instance, by no means as certain in its nature, is the possible relationship between the salicylates and the microörganism which is responsible for the occurrence of acute articular rheumatism. Aside from these instances, however, there are practically no others, and as Cushny well says in an article which he has contributed to the *Proceedings of the Royal Society of Medicine of London* for February, 1909, "the hopes that a drug would be found to act as a general bactericide in the tissues have receded as our knowledge of the enemy has increased."

Infecting microörganisms, when in the tissues, as the result of their far greater antiquity than ourselves, and also as the result of their ability to adapt themselves to their surroundings, are capable of resisting all destructive measures as yet discovered. Taking, for example, corrosive sublimate, which is well known to be one of the most powerful bactericides, Cushny points out that a solution of 1 to 5000 is fatal to microbes, but in order to disinfect a bulk of fluid corresponding to the weight of an average man we would have to give over 200 grains of this drug to produce a solution of sufficient strength to be efficacious. Cushny even goes so far as to assert that the idea of a general disinfectant for the tissues has been abandoned by most thinking minds. For these reasons we are in accord with him in believing that the intravenous injection of colloidal silver, and still more the inunction of colloidal silver, in septicemia is utterly futile, as is also the administration of creosote, in any dose which is safe, for the purpose of combating infections of the lung. This is the more true in view of the fact that the pulmonary tissues are exceedingly delicate and injured by the causes which would not affect other portions of the body. As Cushny well says, "attempts at disinfection by inhalation are fortunately frustrated by the closure of the glottis."

It is, however, a fact that those infections which are due to an animal organism are more amenable to treatment than those which are due to a vegetable organism, perhaps because the former do not adjust themselves to their surroundings so successfully, neither do the animal parasites seem to secrete toxins, at least to the same extent as do the bacteria. The diseases from which man suffers most frequently are those which are due to the vegetable parasites, and it is only in the case of the trypanosoma and the spirilla that we have as yet discovered any substances which

are destructive to them and yet not destructive to their host when given in efficient dose. The most successful of these substances are arsenical in nature, and although Fowler's solution and similar familiar types of arsenical preparations have been found to possess little power, a number of collateral products have been found to be quite active. So, too, it has been found that antimony and even bismuth have a deleterious influence upon these parasites.

It is an interesting fact that such parasites speedily become accustomed to these poisons with far greater rapidity than do their hosts, and so a cure fails to occur unless the dose is most skilfully adjusted. Not only is this true, but these parasites not infrequently develop the most extraordinary resistance to arsenical solutions which in the beginning were most active in their destruction.

In this connection we desire to call attention to a most interesting contribution made to the *Archives of Internal Medicine* of March 15, 1909, by Terry, of the Rockefeller Institute for Medical Research. In this article the question of infection by animal parasites in the blood and lymph glands is carefully considered, as are also investigations which have been made concerning the influence of many drugs upon the infecting organisms.

Most of our readers are probably familiar with the fact that atoxyl, a new arsenical preparation, has proved to be a most valuable drug for the cure of trypanosomiasis and syphilis. As long ago as 1904 Ehrlich and Shiga undertook to discover some remedy which would combat the parasite of sleeping sickness and its various associated organisms, and since then a large number of investigators acting with them, or independently, have pursued these researches unceasingly. The substances which have been found to be distinctly active are not only atoxyl and acetyl-atoxyl and related products, but also the benzidine dyes, the tryphenyl-methane dyes, and the antimony compounds, such as sodium-antimonial-tartrate and potassium-antimonial-tartrate. Because the trypanosomes have been found to be peculiarly susceptible to one of the benzidine dyes, which is red in hue, this dye has received the name of "Trypan Red." Unfortunately this and other dyes have, however, been found to act deleteriously upon the infected animal, causing sloughing at the point of injection or severe nephritis in many cases. They have also proved of little value when given by the stomach, although they possess certain prophylactic powers when used by this avenue of entrance. On the other hand, it has been shown that atoxyl and its related products can be given hypodermically with great efficiency. To express the matter briefly, atoxyl is, to man, apparently about one-fortieth as toxic as Fowler's solution and less irritating locally. If given in sufficient amount it speedily acts upon the invading parasite. Thus, in one instance Thomas showed that involution forms of parasites occurred in the blood of infected animals four to six hours after the administration of the remedy, and that by the eighteenth hour all the organisms had disappeared. Occasionally, however, it does not act with such rapidity.

The most thorough investigation of the value of atoxyl in human beings suffering from trypanosomiasis is that of Koch, who has treated a larger number of cases than any one who has experimented along these lines.

Three chief points have become clearly manifested by investigations made up to this time. The first of these is that the drug must be given repeatedly over a long period of time, and with great constancy. The second is that while on the one hand the dose must be adequate, on the other it is emphatically true that the principle that if a little is good more is better does not hold in this instance, since if too large doses are administered patients nearly always develop optic atrophy, resulting in a blindness which is usually persistent. The third point is that if inadequate doses are employed a strain of immune parasites are developed which safe doses are unable to combat. Koch believes that the proper dose, to be efficacious on the one hand and not danger-

ous on the other, is 0.5 (about 7 grains), and that in sleeping sickness to use less than this is to delay the cure and to invite failure. His method of administration is to give this dose on two consecutive days, allowing an interval of ten days to occur before the next double dose. This method of dosage must be continued for many months, and the drug must be given hypodermically or intramuscularly, since when given by the mouth it almost always fails.

The investigations of Ehrlich and his associates have also provided us with acetyl-atoxyl and paraxybenzyliden-atoxyl, which have been proved to be much more efficacious than atoxyl when the trypanosomes infect animals, but as yet there is not sufficient evidence as to their safety and value in man, the more so as these same investigators have found that many remedies which are efficient in some animals are useless in others. Thus, these new compounds produce brilliant results in infected mice and are singularly non-toxic in these animals, whereas they frequently fail in the horse and guinea-pig. So, too, the antimonial preparations, of which we have spoken, have as yet not been tried sufficiently to justify us in depending upon them. Ehrlich, too, has found that acetyl-atoxyl in mice not infrequently produces a condition singularly like that of the well-known waltzing Japanese mice, so that the animals spin round and round, first in one direction and then in another. Curiously enough this effect often did not develop until many months after the drug was given, but the habit, when acquired, persisted until the death of the animal.

It is interesting in this connection to note that 22 of Koch's 1633 patients who received atoxyl lost their sight from toxic optic atrophy, and that other investigators have obtained even worse results.

In view of the fact that infection from these parasites is so rarely met with in the United States this whole subject is in one sense of more scientific than practical interest to physicians in this country, but there are certain facts concerning it which are of extraordinary interest to all as indicative of what future therapeutic study may develop, and these are connected with a subject already referred to, namely, the development of resistance on the part of invading microörganisms to drugs which are primarily particularly destructive to their existence. Thus, Ehrlich found in the case of the aniline dyes that after the parasites had disappeared from the blood and lymph nodes, and the administration of the dye was discontinued, the disease frequently recurred without any fresh infection taking place and resisted the remedies used. It was therefore evident that either the animal had acquired the power of rendering the drugs harmless or the parasites had become resistant to them. It was soon found that the latter was the case, and furthermore it was discovered that when resistance to medication once developed it persisted for an indefinite time. Thus, Ehrlich passed the microörganism through twenty-five normal mice, and found it still resistant to parafuchsin, but after it had passed through forty mice it was no longer resistant. With atoxyl the same resistance was developed and was not lost till after its eighty-seventh passage, and some strains of the parasites have as yet shown no signs of losing their resistance after many more passages and after many months of treatment. Browning reports a strain resistant to atoxyl after passing through 140 normal mice in the course of fourteen months. It has further been found that organisms which have become resistant to atoxyl are also resistant to the nearly-related atoxyl bodies to which we have referred, and that the same facts hold true in regard to trypan blue and trypan red. All strains are not resistant to every medicament, and some that are very resistant to one drug speedily yield to others, but it is also entirely possible for a strain of parasites which have become resistant to one drug to develop a similar resistance to others. It is evident therefore that in certain cases a form of combined treatment is advantageous, and working with animals it has been found that the simultaneous injection of atoxyl and bichloride of mercury will often cure when

either drug given alone fails. So, too, the simultaneous use of atoxyl and its near relatives often produces better results than does atoxyl alone.

Space does not permit us to deal more fully with this interesting subject, but it is worthy of note that investigations as to the influence of drugs upon various infections by spirilla have proved equally satisfactory and interesting both in animals and in man. Thus, African Tick Fever, due to the *Spirillum Duttoni,* has been found to yield to trypan red and other dyes, although so far atoxyl has proved to be feeble. European relapsing fever (of which outbreaks have occurred in this country), which is due to the *Spirillum Obermeieri,* has been found to yield to full doses of atoxyl. Thus, Glaubermann treated an epidemic of this disease in Moscow in 1907 with this drug. To 70 patients, in whom the organism was found in the blood, he gave atoxyl in doses varying from 0.6 to 1.7 in the course of six or seven days, the maximum single dose being 0.5. In untreated patients a relapse occurred in 87 per cent. In the patients treated by atoxyl a relapse occurred in only 32 per cent.

When we consider syphilis, which is due to another form of spirillum, we come in closer contact with conditions which are interesting to every practitioner. There can be no doubt whatever that in atoxyl we have a most valuable addition to our older methods of treating this disease. This has been proved not only by experiments upon the higher apes but also in man. Salmon has shown that atoxyl may be used as a prophylactic, and if given at the moment the initial lesion appears, distinctly diminishes the virulence, although it does not cure unless the doses are given for a long period of time. He goes so far as to assert that atoxyl is comparable to mercury in its value. He claims that the atoxyl cures the lesions that mercury cures, and Hallopeau considers it a "third specific," while Lassar asserts that the various syphilitic skin lesions yield rapidly to atoxyl. Here, again, the correct dose is 0.5. If more than this is given the vision is in danger. Salmon states that in treating 181 syphilitic patients he gave 1349 injections and had no trouble with their acuity of vision. Salmon uses the drug in 10- to 15-per-cent solution, and sterilizes it by boiling for two minutes, but as aqueous solutions of atoxyl do not keep they should be freshly prepared.

It would seem, according to Terry, that the chief field of atoxyl is in those patients in whom mercury has failed or in those who have such an idiosyncrasy toward mercury and the iodides that they cannot be thoroughly used. He asserts that it is in this class of cases that atoxyl has given the most brilliant results. On the other hand there are a certain number of persons who manifest an idiosyncrasy toward atoxyl, and who, if they do not develop ocular symptoms, exhibit evidences of gastrointestinal disorder manifesting itself in colic and vomiting, which symptoms, however, are usually allayed by opium. It would seem, according to the experience of Salmon, that it is often useful to alternate atoxyl with mercurials, particularly in refractory cases.

We therefore have had developed not only most interesting facts in regard to our means of combating invading organisms and in regard to the development of immunity on the part of these organisms to drugs, but we have also had added to our list of remedies a number of substances the use of which is based upon scientific knowledge.

THE TREATMENT OF WHOOPING-COUGH.

There are few diseases so slightly serious in themselves, in distinction from the gravity of their complications, which yield so little to therapeutic measures as does whooping-cough. We think that every practitioner of large experience will agree with Carpenter, who contributes a paper to the *Proceedings of the Royal Society of Medicine* for January, 1909, when he states that the treatment of pertussis has been, in his experience, most unsatisfactory. He has used a host of remedies internally, and by local application, and found that they were all of little or no value. He has no

faith in quinine, but little in the bromides and belladonna, and still less in the impregnation of the air of the room with carbolic acid vapor from suspended cloths. He points out, however, that there are a number of measures which can be undertaken by the physician which are of very material advantage to the child who may be affected by this pertinacious malady. The first of these is the recollection that lung complications are exceedingly frequent and nearly always serious; that inanition from frequent vomiting and loss of appetite is by no means uncommon; and again, that emotional disturbances such as rage and fear may produce severe paroxysms, and that any source of powerful irritation may do likewise, such as an overloaded stomach, exposure to cold, or an examination of one of the body orifices. In other words, careful and appropriate hygienic conditions with plenty of fresh air and a mild temperature are essential, and frequent feeding with small and easily-digested meals is advisable—the child being at once refed when a sharp attack has caused it to empty its stomach. Carpenter believes that attention to the condition of the nasopharynx during the course of the disease is essential, and that Dobell's solution, or some other alkaline solution, used as a douche or gargle in children who are old enough to have it employed, is distinctly advantageous. He believes that the temperature of the room should be in the daytime as low as 60° and at night as low as 55° Fahr.; and finally he insists upon the importance of prophylaxis, since by this means other children are protected who, if they fall victims to the disease, will in a certain proportion of cases die from its effects. In other words, children with whooping-cough should be isolated, and this is particularly essential where other children below the fifth year of age are in danger of exposure, since it is in this type of case that the pulmonary complications so frequently cause death. Again, Carpenter is one of those who believe that an attack of whooping-cough distinctly predisposes to tuberculosis, and he asserts that in England an unusually large proportion of children die of tuberculosis subsequent to whooping-cough. While this has not been our experience, at the same time it emphasizes the necessity of protecting children from both infections.

THE INFLUENCE OF EMOTIONAL STATES ON THE FUNCTIONS OF THE BODY AND THE INFLUENCE OF DRUGS.

We have read with much interest an article dealing with the influence of emotional states on the functions of the alimentary canal, contributed to the *American Journal of the Medical Sciences* for April, 1909, by Dr. W. B. Cannon, the Professor of Physiology in the Harvard Medical School. In this article he calls attention to the facts, so well recognized by every one, that certain emotional states are capable of powerfully influencing many of the functions of the body, as manifested by the pallor of fear, the flushing of embarrassment, and the nausea of disgust. So, too, we meet with various disturbances in the function of the urinary bladder produced by emotional causes, and now and again we meet with instances in which great disturbances of the emotions result in various digestive disorders. Cannon quotes a very considerable number of experiments made upon human beings and upon animals, by various investigators in this country and abroad, which prove beyond all doubt that mental impulses influence the activity of the alimentary canal not only as to its movements but also as to the secretion of its various digestive juices, and in his own investigations he found that not infrequently fear or rage inhibited peristaltic movement in the intestine and arrested the movements of the stomach as well.

These investigations are all the more interesting because of their bearing upon practical medicine, since the results of emotional disturbances are capable of producing very erroneous diagnostic conclusions and at times prevent the development of the physiological effects of drugs by delaying their absorption. The well-known state-

ment of Hunter that any rascal who chose to make him angry had his life in his hands is a classical illustration of the recognition on the part of medical men that grave circulatory disorders may become acutely dangerous if the emotions are aroused, and those physicians who have had considerable experience in treating angina pectoris in its various forms are fully aware of the influence which nervous stress and strain are capable of exerting in these cases. So, too, it not infrequently happens that patients on visiting a physician present so many symptoms of excessive activity in the circulatory system as to completely mislead him as to their ordinary circulatory state, and it is only when they have been seen at rest in bed, and on several occasions, that the physician finds that after all the pulse-rate and the blood-pressure are not markedly at variance from the normal. This psychic effect upon the circulation also frequently gives erroneous records when the syhygmomanometer is employed. Cannon cites an interesting instance in which a woman who suffered from digestive disturbance went to Boston to have an examination made of her gastric contents in order that by this means further light might be thrown upon her case. The morning of her arrival an examination of the stomach contents, an hour after a test meal, revealed no free acid and no evidence that digestion of the test breakfast had occurred. Indeed, a considerable amount of the supper of the previous evening was still present. Naturally such a result might have led to a very erroneous diagnosis indicating an atrophic gastric catarrh or even carcinoma of the stomach, but careful inquiry revealed the fact that she had been much disturbed mentally by the conduct of her husband, who had become uncontrollably drunk on his arrival in the city. The return of the spouse to a state of sobriety and a good night's rest resulted the next morning in the test breakfast giving entirely normal results. These facts illustrate the value of advising patients who have a feeble digestion to go to their meals in a condition of mental quiet, and to be as devoid of worry as possible. They also show why it is that not infrequently the administration of drugs fails to produce a physiological effect for a very considerable period of time, because the processes of absorption in the stomach are held in abeyance by emotional influences. This is particularly the case in persons who are neurotic. They seem very frequently to be unusually immune to the action of powerful remedies, but in reality are as susceptible as ordinary individuals if the stomach is capable of performing its normal functions uninfluenced by nervous disturbances.

THE OPERATIVE TREATMENT OF CHRONIC CONSTIPATION.

A noteworthy contribution to this topic, in which because of the occasional failure of dietetic, hygienic, and medicinal means surgical intervention is becoming increasingly popular, appears in a brochure by Arbuthnot Lane. In his usual original, dogmatic, and always entertaining style he emphasizes certain of his theories having to do with the enormous influence exerted by posture upon the formation of the body, applying these theories to an explanation of mesenteric contractures, intestinal adhesions, and band formations which appear without the intervention of inflammation, and which in certain instances are responsible for a form of constipation quite beyond the reach of any treatment other than direct intervention.

His explanation of inveterate and chronic constipation in the human is based on the belief that the erect posture favors a drag upon the entire large bowel, which is regarded as merely a fecal reservoir, of such nature that it becomes increasingly incapable of emptying itself. This drag is further accentuated by the artificial position used in defecation in all civilized countries. The comfortable seats employed, whilst they favor the forward inclination of the body, do not provide for the abdominal support and pressure incident to the apposition of the thighs against the belly walls in the normal or squatting posture. This sagging

of the gut with sequential dragging down of the stomach and the kidneys is more pronounced in women because of their different conformation and their weaker abdominal walls. As the result of intestinal stasis the intestines become thin and lacking in muscular tonus, whilst because of the resultant autointoxication there develops a train of symptoms highly characteristic. Progressive loss of fat and increased staining of the skin are regarded as the most marked objective features of this form of poisoning. There is thus produced the appearance of premature age, which is so characteristic of faulty intestinal drainage. Because all the viscera of the abdomen are much affected, a condition of enteroptosis ensues. The skin is abnormally dark, inelastic, and dirty looking, and the perspiration becomes offensive. The skin staining is at first transitory and is partly general and partly local. During these transitory attacks the person is customarily described as being bilious. Cold and clammy hands and feet are characteristic, as is the thick, coarse, and blotched appearance of the back part of the upper arm and forearm. The skin covering the spines of the lumbar vertebræ, especially in women, the neck, the eyelids, the round parts of the cheek and temples show the pigmentation markedly. Aside from the influence of intestinal sepsis and production of gall-stones, Lane holds that the distended cecum in the true pelvis interferes with the efficient performance of the ovaries and Fallopian tubes, and that the breasts undergo degenerative cystic change at an early period. He believes that whilst a woman whose intestinal drainage is satisfactory may go through life without sexual intercourse and may undergo no special degenerative changes in her sexual apparatus, one who suffers sufficiently from imperfect drainage will of necessity undergo changes of varying severity in her sexual organs if she remains a virgin. Regular sexual intercourse, he believes, opposes cystic degeneration of the breast. The presence of toxic material in the circulation renders the resisting power to the entry of organisms weaker, and so makes the sufferer a more ready victim to tubercle, rheumatoid arthritis, gout, and other diseases, whilst gastric and duodenal ulcers are not infrequent complications.

As to the psychic symptoms of toxic absorption in the gastrointestinal tract Lane notes inability to concentrate the attention, drowsiness, giddiness, neuralgia or headache, and loss of control over the temper. He attributes the betterment some people experience by lying down at noontime to the fact that in this position the obstruction to cecal drainage is removed. Thus the patient is enabled to make a fresh start.

As to treatment, Lane states that he has obtained some success in cases of chronic constipation not amenable to medical treatment by dividing constricting bands and adhesions and by careful attention to subsequent functioning of the bowel. In a considerable proportion of cases, more particularly in women, he has found such means insufficient. In his earliest cases after he had removed the appendix and the cecum and flexures had been freed from adhesions, the patient still suffered from cecal pain. For the relief of this condition the very simple expedient of removing the entire large bowel was adopted. In his first case he merely made a lateral anastomosis between the ileum and the sigmoid, but the early return of pain obliged him to divide the ileum. In several cases after he had divided the ileum the patients after the interval of months were occasionally annoyed by the presence of hard, dry masses of fecal matter in the cecum. The discomfort arising from their presence and from flatulent distention was sufficient to cause the removal of the large bowel as far as the splenic flexure.

An extended experience has shown Lane that if any portion of the large bowel is left above the junction of the ileum it tends to dilate sooner or later. This dilatation may interfere with the satisfactory evacuation of feces, and discomfort or pain may ensue because of its distention with fecal matter or gas. "Therefore to overcome completely the constipation as well as the septic absorption the large bowel should

be removed as far as its junction with the ileum, which is effected in the upper part of the rectum or in the adjacent sigmoid." He divides the ileum at a distance of about five or six inches from the cecum. This he states can be done rapidly and securely by encircling it by means of a catgut ligature.

The ileum is divided by the cautery immediately beyond the ligature. The stump is then buried in the proximal bowel by means of a purse-string suture which encircles the bowel and perforates its peritoneal and muscular coats about three-quarters of an inch above its ligatured extremity, rendering the closure absolutely secure.

The acquired adhesions and peritoneum which bind the cecum and ascending colon and abdominal wall external to them are divided, and the bowel is raised until the vessels which supply it are exposed. These are grasped in compression forceps and firmly ligatured. The vessels supplying the transverse colon are similarly treated, and finally the descending colon and perhaps the sigmoid are removed, the upper limit of the rectum or the lower part of the sigmoid being included in the same manner as the ileum. Originally Lane states he was content to divide the descending colon at the splenic flexure, but he now removes the descending colon and a portion or the whole of the sigmoid, closing the large bowel at, or just above, its junction with the rectum. The termination of the ileum and the sigmoid or rectum adjacent to it are brought into convenient apposition, and a perfectly secure and reliable lateral anastomosis is made by means of a double row of continuous sutures. Subsequent dilatation of the ileum beyond the seat of lateral anastomosis may be avoided by sewing down and obliterating the lumen of the distal gut right up to the aperture of communication with the large bowel.

Finally, a fine gut ligature is passed through the free incised margin of the mesentery of the ileum, and then beneath the peritoneum forming the outer wall of the mesorectum. This when made tight brings the rectum to the middle line of the pelvis and fixes it securely in that situation immediately beneath the position occupied normally by the divided end of the ileum. The ligature also closes the interval between these two mesenteries, through which a loop of bowel might otherwise pass and give trouble.

Lane very conservatively states that there are many cases in which the patient is unable to sustain the strain of the removal of the large bowel, but can that of division of the small bowel and the establishment of a connection between it and the sigmoid or rectum. This operation relieves the patient of the toxemia.

The large bowel can be removed at a later date with much less risk—indeed, this simpler operation is in itself curative when the symptoms are those of toxemia rather than pain. Lane states when the stomach is exposed it is usually found to be dilated to a varying extent. This condition he relieves by dividing the adhesions of the pylorus to the liver and the gall-bladder. Their reformation he believes he prevents by the employment of gold leaf, or if this measure is not successful after removal of the entire colon gastroenterostomy is done. It is apparent that the mobile kidneys which so frequently complicate the condition which he describes are secured in place with uninterrupted success by suture. If the sigmoid is enormously dilated and acutely inflamed two modes of treatment suggest themselves. On two occasions, after draining and washing out the bowel he has excised the entire loop and obtained a perfect junction by the use of the Murphy button. He notes that except in patients who are extremely toxic and feeble the removal of the large bowel is not accompanied with any special danger to life. He states of the many cases of chronic intestinal sespsis seen in private practice which call for operative interference he has removed the large bowel in only nine. He has, however, operated on a large number of private cases by dividing the ileum and forming the junction with the large bowel. The chief danger which he feared for a long time was vomiting, which continued for several days. He found that this could

be obviated altogether by introducing a large quantity of normal saline solution into the subcutaneous tissue at the commencement of the operation.

His technique at present is to plunge a needle beneath the skin and begin subcutaneous saline injection the moment the patient is on the operating table.

It is undoubtedly true that the majority of surgeons when they have finished this brochure of Lane's will close the book unconvinced as to the general soundness of his contentions, or the wisdom of his therapeutics, and intensely curious as to the clinical notes of the cases on which he has operated, both before and after surgical intervention. Lane himself quotes with a kindly and pitying superiority the language of one of his detractors as follows: "That it must be difficult for the ordinary man to grasp this mechanical sequence is shown by the following extract from the Cavendish Lecture which was delivered before the West London Medico-Chirurgical Society on June 21, 1907. The eminent author refers to it in these words: 'I shall not attempt to soar with him into the rolling clouds of anatomical and transcendental pathology into which his writings are lifted by an envelope of fact distended by the hydrogen of a strong imagination. I should as soon think of sketching you for a portrait of a Ginn from the Arabian Nights. Those "thousand and one tales" were translated by a great Arabic scholar whose name was Lane, and I should be inclined to think that the author's name was Lane too, only works are usually written first and translated afterward, which presents a greater difficulty to me than it would to Mr. Arbuthnot Lane, who says that in appendicitis the adhesions form first and the appendicitis afterward.' I do not quote these remarks in any unkind spirit of criticism; I merely do so to illustrate the mental attitude of a certain number of surgeons toward anything that they do not understand."

Lane subsequently demonstrates by autopsy findings other than his own at least the truth of his contention that matting together of parts of the colon with kinking, dropping of the pylorus, biliary lithiasis, adhesions of the appendix and uterine appendages, and a slight degree of enteroptosis may be of apparently non-inflammatory origin.

SUBPHRENIC ABSCESS.

This affection, which receives but scant notice in text-books, is encountered with sufficient frequency in surgical practice to make it one of major importance. This is particularly the case since the diagnosis may be extremely difficult and the treatment in its details is by no means well formulated. Guibal holds that the comparative infrequency with which these cases are reported is probably incident to the fact that they are either not recognized at all or are mistaken for cases of pleurisy and incorrectly treated as such. Guibal offers a somewhat elaborate classification of the position in which subphrenic abscess may be placed based on the anatomy of the parts. He describes five subphrenic pockets: one, retroperitoneal; four, intraperitoneal. Of the latter, two lie between the diaphragm and the liver, separated from each other by the falciform ligament; the right phrenohepatic pocket is open in front and to the right side, communicating in these regions with the general peritoneal cavity and especially with the subhepatic space. Right phrenohepatic abscesses originate in suppuration of the right lobe of the liver, or in inflammation of a structure in this region such as the gall-bladder, gall-passages, pylorus, first portion of the duodenum, and the hepatic flexure of the colon. The left phrenohepatic pocket communicates with the general peritoneal cavity in front and on the left with the perisplenic space. The left phrenohepatic abscesses are caused by suppuration of the left lobe of the liver or by the extension of inflammation from the general peritoneal cavity, nearly always caused by a gastric lesion. The perisplenic or phrenogastrosplenic pocket is not well defined. Abscesses placed here are usually secondary to lesions of the larger curvature of the stomach, secondary to an in-

flammation of the spleen, and exceptionally to lesions of the splenic flexure of the colon. They are not easily distinguished from the median subphrenic abscesses. The posterior gastrohepatic space is the fourth subphrenic intraperitoneal pocket. It is in large part hepatic. Abscesses here are usually due to lesions of the posterior wall of the stomach, the pancreas, or exceptionally to suppuration of the liver or spleen. The extraperitoneal subphrenic space, where retroperitoneal is rich in cellular tissue, contains the termination of the esophagus, the posterior surface of the cardiac orifice and the upper, outer part of the stomach, posterior surface of the liver, pancreas, duodenum, colon, descending and ascending colons, and the kidneys.

Guibal (*Revue de Chirurgie*, No. 3, 1909) advises, in making the diagnosis, exploratory puncture and the use of the radioscope. Exploratory puncture is employed when clinical signs are not sufficiently suggestive, but only under such circumstances. Guibal notes at least one fatal case due immediately to this method of exploration. If exploratory puncture is advisable all preparations should be made for immediate operation in case the abscess is found.

Fluoroscopic examination shows a departure from the normal conformation of the diaphragm and also immobilization of this muscle on the affected side. Fever is rarely pronounced and may be absent. It is often characterized by marked fluctuation, by chills and sweats. Evacuation into the intestines converts a purulent abscess into one which contains also gas. This is not a favorable termination since cure rarely results, the patient finally perishing of prolonged hectic.

General peritonitis is not a rare sequel. The usual direction of extension is, however, toward the thorax. Pericarditis has frequently been noted as a complication. Leyden regards inflammation of the pleura as a constant complication. There may be a dry pleurisy, serous effusion, and empyema or pyopneumothorax. Rupture into a bronchus has been observed in 22 cases out of 168. This rupture into a bronchus is not infrequently preceded by an unusually severe pain referred to the shoulder of the affected side, by an access of fever, increased dyspnea, and mucopurulent, sanguinolent, fetid expectoration. The diagnosis may be extremely easy, ofttimes it is difficult or impossible.

The prognosis of the subphrenic abscess is in the main dependent upon a timely surgical intervention. Spontaneous cure occasionally takes place. The prospect of this is, however, well shown by Lauenstein's statistics, which note that of 104 cases treated medically 98 died. Of 74 cases operated upon 39 were cured, whilst Schurlen reports a mortality of 82 per cent in the non-operative cases and Martinet a mortality of 88 per cent. Lejars reports 59 cases of subphrenic abscess, appendicular in origin. Sixteen of these were not operated upon. Ten died and five got well, four by rupture into a bronchus, though the latter can scarcely be called a cure. Spontaneous rupture through the skin is extremely rare. Evacuation of the abscess through an abdominal viscus should be regarded as a complication rather than a cure, since it always implies prolonged suppuration.

The prognosis depends not only upon surgical treatment but upon its timeliness. Thus, Sachs records that of eight patients with subdiaphragmatic abscess secondary to appendicitis, operated upon more than three weeks from the beginning of this complication, four died, whilst of 13 patients operated on before the third week of the complication only one died.

As to treatment, every subphrenic abscess ought to be opened by large incision so placed as to secure free drainage. The abscess should be opened by abdominal incision only when this cut can evacuate pus without opening the general peritoneal cavity. Visceral perforations causing abscess should be sutured. When the abscess lies beneath the border of the ribs free access may be impossible without resection of bone or cartilage. A number of operations have been proposed to accomplish this end, but perhaps the best method of attaining it is by the procedure proposed by Auvray.

After making an incision to the lower border of the ribs and from the middle line outward, the muscular insertions of the outer ribs and cartilages are divided and the cartilage of the seventh rib is cut through, lifted out, and the muscular insertions at its deeper surface dissected away or sponged loose, great care being taken to avoid wounding the pleura, and as much of the cartilage and bone is resected as is needful for room. The cartilage above the seventh rib may then be separated from the deeper connection without difficulty until sufficient space is given for reaching the abscess. When the pleural cul-de-sac is reached it can be pushed aside, together with the soft parts. The stripping of the parietal pleura from the diaphragm itself is difficult, indeed may be quite impossible. Hence the abscess should be reached by stripping up both the pleura and the diaphragm after the resection of the rib beyond the limit of the pleural cul-de-sac.

Siraud and Tartavy advise periosteal resection of 7 centimeters of the seventh rib, with a portion of the cartilage. The pleural cul-de-sac can then be seen passing obliquely downward and outward, depending upon whether the abscess is placed high or low. Ten to twelve centimeters of the sixth or of the eighth rib may be removed. It is then easy to strip the parietal layer of the pleura as high and as wide as is needful without fearing a tear, for it is here double and reënforced by a strong aponeurotic layer and separated from the parietes by a cellulofatty tissue which facilitates cleavage. The thin adherent phrenic portion of the parietal pleura should be left intact, the diaphragm being divided beneath the cul-de-sac, which is clearly visible, and it together with its pleura then being lifted up. This makes the subphrenic space extremely accessible. When the abscess is reached through the pleura, in the absence of adhesions a purulent pleurisy is almost certain to follow. This may be avoided by a preliminary suture of the costal and diaphragmatic pleura before making incision. When the pleura contains serous effusion as a complication of subdiaphragmatic abscess Monod has advised the evacuation of this fluid, washing the pleura and suturing the diaphragm to the chest wall and opening the abscess. When the pleura contains pus, this is first evacuated by a low incision; the perforation of the diaphragm is then found—if small it is enlarged. If not well placed for drainage the abscess is incised in a better position.

After-treatment depends upon free drainage of the abscess and of the pleural cavity when it is infected. Lavage of the subphrenic cavity after opening would seem to be indicated, but in some instances sudden death has occurred quite comparable to a similar complication noted after evacuation of a pleural abscess. When the opening cannot be placed to best advantage for drainage aspiration is indicated by means of a water pump or simple siphon. Where an abscess is placed posteriorly but beneath the protection of the ribs, transverse incision following the lower right border and running from the sacrolumbar mass of muscles to the hypochondrium is advised. If the abscess lies too high to be reached in this way Israel's incision is advised. A long cut passes from the angle made by the sacrolumbar muscles with the twelfth rib, crossing directly outward; the twelfth rib is resected subperiosteally. The pleural pouch is pushed upward and the upper pole of the kidney exposed. This is freed from its pouch, pushed downward, inward, and forward, exposing the renal fossa of the liver, and above this is the hepatodiaphragmatic space, in which further exploration can be carried. The usual cause of death in these abscesses is multiplicity of lesions through steady extension, and sepsis, from which the patients suffer.

REPORTS ON THERAPEUTIC PROGRESS.

ALLEGED DANGERS OF THE CONJUNCTIVAL REACTION.

TEICHMANN (*Mediz. Klinik.*, June 28, 1908) bases the following conclusions on his observation of 1500 cases, and on a comparison with the results obtained by others: (1) That the harm alleged to have been caused by the conjunctival reaction depends without exception on the choice of unsuitable tuberculin preparations or on the neglect of important contraindications. (2) That the instillation, in diseased and especially in tuberculous eyes, in the scrofulous, particularly in those of youthful age, and a second time in the same eye, especially with strong solutions, is not permissible. (3) That the conjunctival reaction—undertaken with freshly-prepared solution—is absolutely free from danger, and is at present the simplest means of diagnosing a tuberculous focus, not recognizable by our other clinical methods of examination.

The cases observed by Teichmann were all treated with one per cent old tuberculin, and the majority showed only a mild conjunctivitis lasting three or four days. Isolated cases, however, occurred in which chemosis, follicular enlargement, purulent secretion, and subjective sensations of pressure and burning were present. These were limited to the conjunctiva, and disappeared in four to eight days, leaving no trace, and the eyes after some further months of observation still gave no sign of conjunctival irritation. Reactions which threaten to be severe are readily checked by the instillation of cocaine 2 per cent and adrenalin 1 in 1000. These marked reactions occur almost solely in cases in which tuberculosis is clinically manifest, so that the test will not in future be used in such cases, but if it is used, a transient ophthalmia is better than the general disturbances which, in these same cases, would probably occur from the injection of tuberculin. Severe conjunctivitis of long duration, corneal ulcers, iritis, etc., described as having been occasioned by the conjunctival reaction, were in no case observed.

Calmette's and Höchst's tuberculin are inconstant and much too strong. The author advises the use of Koch's old tuberculin in one-per-cent or at most two-per-cent solution. Any irritant condition of the cornea is an absolute contraindication. Simple chronic conjunctivitis was never made worse, nor did any complication arise, but the test is difficult to determine in such cases. In the literature, harm resulted in no case (with a single unexplained exception) from any other cause than the omission of one or other of the above mentioned precautions, which have been experimentally learned to be necessary.—*British Medical Journal*, March 1, 1909.

THE THERAPEUTIC APPLICATIONS OF RADIUM: METHODS AND RESULTS.

To the *British Medical Journal* of March 6, 1909, DAVIDSON contributes an interesting paper on this topic. He says that as soon as the physical properties of radium became known, it was obvious, in the light of our previous experience of the beneficial effect of *x*-rays and of the ultraviolet light (Finsen method) in the treatment of various skin diseases, that this new substance would prove to be of some service in medicine. Indeed, seeing that radium gave forth *x*-rays of extreme penetrability, the gamma-rays—in addition to its alpha- and beta-rays—it seemed likely enough, *a priori*, that it might exceed the results produced by either the *x*-rays or the Finsen method. And such, in fact, has proved to be the case.

Having been fortunate enough to secure some radium bromide of good quality early in 1903, the author tried it in a case of severe rodent ulcer, which had resisted the *x*-ray and other treatment, and had been sent to him at Charing Cross Hospital, from the skin department, for further

treatment with the *x*-rays. He used two sealed glass tubes, each containing 5 milligrammes of pure radium bromide, and applied them tentatively on the upper border of the ulcer, which was encroaching on the lower right eyelid. After five applications the ulcer, which was one inch in length and three-fourths inch broad, was completely healed. There has never been any recurrence, and at the present time the patient is perfectly well.

In this connection the author mentions the fact that in cases of carcinoma in which there occurred very small discrete nodules of this disease, and which therefore offered an opportunity of testing the effect of a small amount of radium, he placed radium in a glass tube directly in contact with these nodules; but even after being applied for varying periods, long enough to produce destructive effects, there was no destruction of the cancer cells. Consequently these must be immensely more resistant to the beta- and gamma-rays than are those of rodent ulcer and epithelioma.

A few words must be said as to the method he has adopted. The application of radium bromide in sealed glass tubes has the advantages that it completely preserves the radium salt from loss by moisture (a matter of the utmost importance in the present scarcity of radium) and that the glass filters out many of those rays which are most easily absorbed, which are therefore most dangerous to the surrounding tissues, and which may lead to burning and sloughing. Moreover, as the radium preserved in this way is in a state of radioactive equilibrium, the dosage necessary is merely a matter of time—the length of application in any particular case being of course determined by experience. The range of action of the radium at the bottom of the tube can be seen by its effect on a photographic plate, or, in the dark, when held in contact with a sulphide of zinc screen, or with willemite. The area of action is much wider than might be imagined. One application to a small rodent ulcer is sometimes enough to effect a permanent cure. But in the case of a comparatively large surface the tube must be moved from point to point, which of course takes time, and is a somewhat tedious process.

As this method has recently been severely criticized it may be worth while pointing out, first, why this particular method was adopted; and secondly, what it has been able to effect. As to the first point, it is no exaggeration to say that the glass-tube method was practically forced upon early workers with radium in that country, on account of the necessity of avoiding the risk of losing so costly and precious a material, seeing that, if lost, it could probably not be replaced. At any rate, it was not from choice, but from necessity, that this method was adopted by him. The author was familiar enough with the physical properties of radium to realize fully the advantages that would result if it could be spread over a large surface with some covering material to hold it, which, while allowing free exit to all radiations, would preserve the precious material intact. But how to do this is by no means so easy as it may appear to those who have never tried it, and few medical men in that country would feel disposed to lose $2500 worth of radium in the attempt. It is interesting to know that this problem of the safe spreading of radium has apparently been solved in Paris, where there exists an institute with over $50,000 worth of radium to experiment with.

But before saying anything about the admittedly great advantages of the spread method, it may be some consolation to those who possess radium bromide in sealed glass tubes, and who may not be able to get it safely spread, that the author points out that, in this form, it is not so entirely worthless as they might have been led to believe. Applied in this way by him it has undoubtedly cured extensive rodent ulcer that had resisted all other treatment; it has cured small epitheliomata; it has cured "spring catarrh" of the eyes (which had resisted other treatment for two years); it has cured recurring erosion of the cornea

(Arlt) of one year's duration, and tuberculosis verrucosa.

In addition to these, there is one result obtained by this method of treatment which seems worthy of special record. In common with other early workers with *x*-rays, the author's right hand has suffered from the ill effects of undue exposure, and some time ago an abrasion, produced by a slight injury, presented a rather alarming appearance. A hard, thickened border with a black crust appeared, and when this had persisted for over two years it became somewhat disquieting. It occurred to the author to try his glass tube of radium upon it, and the result has been that one application of a tube, containing about 28 milligrammes of radium bromide, for fifteen minutes led to its complete disappearance. The same favorable result has followed upon other similar applications. This experience may, the author hopes, be of use to those who have suffered from their work with *x*-rays. At any rate, it will be important to know if they also find radium bromide act as a cure.

In the light of practical experience thus obtained the author says a few words concerning the method of treating skin diseases by means of spread radium in the Laboratoire Biologique de Radium at Paris. There are two great advantages in this method: First, it enables all the radium radiations to come into effective action on the surface to which they are applied. So that all the alpha-, beta-, and gamma-rays may be used, or by the interposition of certain screens all the alpha-rays may be cut off, and, if necessary, the beta-rays; the beta-rays may be cut off by aluminum or leaden screens of varying thickness. The quantity and quality of the rays best suited to cure any particular disease can only be arrived at by trial, and much valuable work in this direction has been done at the Paris Institute. But it is a regrettable fact that the varnish used to protect the radium and the method of spreading it are kept secrets.

In all successful cases the remarkable effect is shown that by properly timed exposures the abnormal cells invading the human body are gradually destroyed and absorbed. Such being the fact, two questions naturally arise: (1) Which of the radiations produce the beneficial results? and (2) What are the abnormal cells which are more resistant to the radiations than the normal body cells? These questions open up an enormous field for careful investigation.

It must be remembered that radium is not the only radioactive body giving off alpha-, beta-, and gamma-rays. There are other substances which do so, such as thorium and actinium, and doubtless others which remain to be discovered. Another point which should not be forgotten, for it is one of great practical importance, is the fact that radium itself does not directly produce all the rays. It first produces what has been called an emanation. The disintegration of this emanation causes it to give out the three types of rays, and the therapeutic action of radium depends mainly on the amount of emanation which it contains. If this store of emanation is driven off by dissolving the radium in water, it proves to be a gas, which when collected gives out the same amount of alpha-, beta-, and gamma-rays that it did when unseparated from the radium. But while the de-emanated radium goes on slowly producing and storing up more emanation until in about one month's time it has regained its maximum strength, the emanation which has been thus separated from its parent goes on decaying, losing about half its strength in about four days, and becoming in about sixteen days almost powerless. The important practical point to be noted is that the effect of the rays from a given quantity of separated emanation is as powerful as when it was contained in the radium, and that, consequently, it is possible to send a tube of the emanation to be used in the treatment of a case at a considerable distance without any risk of losing the precious radium itself in course of transport.

THE ROENTGEN RAYS IN THE TREATMENT OF DEEP-SEATED MALIGNANT DISEASE.

PFAHLER reaches the following conclusions in a paper contributed to the *American Journal of the Medical Sciences* for April, 1909:

1. Cases that are operable should be operated upon, and this should be followed by early and thorough postoperative Roentgen ray treatment.

2. Sarcomata yield better to the *x*-rays than carcinomata. In sarcoma it seems that we may hope for 50 per cent of recoveries. In the series reported 65 per cent have recovered.

3. Localized recurrent carcinoma will usually yield to the Roentgen rays, unless the mucous membrane be involved.

4. Occasionally good results are obtained even in advanced cases of carcinoma, but generally one can hope only for palliation or prolongation of life.

5. Good results will depend very much upon good technique.

DYSPEPSIA DUE TO ALCOHOLIC ABUSE.

Sir DYCE DUCKWORTH in the *Clinical Journal* of March 24, 1909, in writing on this subject says that the first point in treatment is to cut off all alcohol. If the esophagismus or spasm of the irritable pharynx and gullet is so great that no form of nourishment can be taken, we may reduce this by the use of a spray of solution of cocaine, two-per-cent strength, and if some of this is swallowed the action may be still more beneficial. Vomiting may be usefully encouraged when swallowing is possible by draughts of warm (not hot) water, and these help to cleanse the mucous surfaces of foul exudation. Whey is the next article of nourishment to employ, and may be given in any quantity, followed up by milk containing a drachm of sodium bicarbonate to the pint, or combined with equal amounts of well aerated soda-water. A large linseed and mustard poultice is to be applied to the epigastrium, and repeated or not, according to the tolerance of the skin for it. If diarrhea is persistent lime-water should be added to the milk, and castor oil with tincture of opium given. Half-grain doses of calomel repeated every half-hour may be of service in this condition, or a full dose of 5 or 10 grains given over night, followed by a draught of mistura alba the next morning. Continued vomiting may require doses of 5 minims of dilute hydrocyanic acid in effervescing soda-water, and a mixture of subnitrate of bismuth with sodium bicarbonate may next be given. The dietary is next to be mended by the use of jelly of mutton or veal essence, and later pounded fish may be given.

As the digestion is restored it is found useful to give a bitter tonic containing several bitters, such as calumba, gentian, with five or ten minims of tincture of capsicum, and if there is pain a few minims of tincture of opium may be given with each dose. It is important to mention here that some experienced topers have long found the value of such a mixture as this, and recognize the special benefits of the opium in it, and this to such an extent as to cease their alcoholic potations and drift into opium takers. This has been observed especially in the case of women. This resort to opium and other stupefacients has been largely observed in the United States, in such parts as have come under strict legislation with regard to alcoholic habits, illustrating the folly of such repressive measures and the impossibility of mending bad habits by improper means.

SPECIFIC AIDS IN THE DIAGNOSIS AND PROGNOSIS OF TUBERCULOSIS.

SILVIO VON RUCK in the *American Journal of the Medical Sciences* for April, 1909, in writing on this subject says that with the introduction of tuberculin a most valuable aid was afforded in determining the presence or absence of tuberculous affections in doubtful cases, and increased interest in the subject was actively aroused by the almost simultaneous and independent communications of Wolff-Eisner and Calmette of their

conjunctival method, and of von Pirquet's cutaneous method of applying tuberculin for diagnostic purposes.

From the literature the author has collected a large number of results of the use of the subcutaneous, cutaneous, and conjunctival methods respectively. From a tabulation of these results it appears that by the subcutaneous method, among 7088 cases tested there were 4805 tuberculous, in 4319 of which the reaction was positive; 479 suspects with 313 positive reactions; and 2804 non-tuberculous cases, in 140 of which positive reactions occurred. By the conjunctival method, among 6449 cases tested, there were 2734 tuberculous, in 2164 of which reaction was positive; 1188 suspects, with 687 positive; and 2527 non-tuberculous subjects, with 347 positive reactions. By von Pirquet's cutaneous method, among 6504 cases tested there were 2182 tuberculous, with 1861 positive reactions; 815 suspects, with 550 positive reactions; and 3507 non-tuberculous subjects, in 1109 of whom the reaction was positive. The later figures include results in 900 non-tuberculous children, of whom 149 had reacted positively. Excluding these cases, there are positive results in 1060 out of 2607 non-tuberculous adults.

The percentages of cases in which positive reactions followed the application of the tests were, respectively:

	Tuberculous. Per cent.	Suspects. Per cent.	Non-tuberculous. Per cent.
Subcutaneous.....	89.88	63.34	51.30
Conjunctival.....	79.20	57.80	13.73
Cutaneous.....	85.29	67.48	31.62
		Exclusive of children	40.66

THE RATIONAL TREATMENT OF TABES DORSALIS.

In the *Medical Record* of April 10, 1909, WILLIAMS after discussing the pathogenesis of tabes dorsalis points out that the Argyll-Robertson pupil and the lymphocytoses of the cerebrospinal fluid are strong evidences of syphilis. The latter is found in the secondary stage in 40 per cent of cases, and irritations of the nerves which pierce the meninges are not uncommon in this late secondary stage, and may even occur during the roseola. More careful investigation is now revealing a syphilitic etiology of many a neuralgia and palsy, more especially of the sciatic nerve and of the face. These are usually quickly removed by mercury in whatever way administered; but in the tertiary stage the therapy is less certain. It would seem that the resistance of the host is impaired, sometimes to the point of hopelessness, as in dementia paralytica, which is now conclusively shown by the Wassermann test to be syphilitic and not parasyphilitic. It is to other causes, therefore, than the nature of the noxa that we must ascribe the failure until now of specific therapy. The author believes these are mainly three: (1) Faulty methods of administration; (2) hasty generalization; and (3) overexpectation.

To give mercury by inunction is to give it in uncertain doses, and to make it inconvenient and often annoying for the patient, and this does not conduce to a psychical attitude, which favors an immunizing process. Salivation and insufficient dose are equally undesirable. When given through the mouth, not only is its absorption uncertain, but that of food is interfered with, and nutrition must suffer. It is only by inserting mercury directly into the body in known quantities that we can commensurately antidote the noxa of syphilis with the minimum of injury to the patient's tissues. Hence it is only by this method that it is fair to judge the specific therapy of tabes and paresis; and recent results have justified the hopefulness of the scientific pharmacologist with respect to this, for numerous cases and cures are being reported.

Now do not misunderstand this statement. Recollect that no one expects a cured consumptive to grow a new lung, for destroyed lung tissue is replaced by cicatrix; the phthisis is, however, cured, although the patient's breathing may continue more or less embarrassed. Similarly with the tabetic, although sclerosis cannot be substituted by nerve fibers, yet the tabes may cease by an arrest of the inflammation which has caused it. The locomotor ataxia,

however, due to the destruction of certain nerve paths will be recovered from only in so far as the patient retains sufficient nerve paths to reëducate. Muscular atrophies of long duration will probably persist, for impenetrable scars are probably present. Trophic changes in joints, ligaments, muscles, and skin, in so far as they are secondary to root-nerve degenerations, will remain in *statu quo ante*. But the invasion of the inflammatory process will cease; the patient is recovered, though not restored. If he has been allowed to proceed to the pitch of incapacity, he may be compared to a case in which the papilloedema produced by intracranial tumor has continued long enough to cause blindness before the intervention of the surgeon has been invoked, however successfully, to remove the neoplasm. The patient is cured, though blind. As much may be said for the recovered consumptive incapacitated by dyspnea.

The moral of the foregoing is the imperative need of early diagnosis of the sometimes fleeting and obscure neuralgia, vertigo, vesical and gastric difficulties, etc., which so often precede the locomotor symptoms of tabes dorsalis. A careful neurological diagnosis, sometimes including examination of cerebrospinal fluid, would enable us to anticipate many a locomotor ataxia. Of course, the Wassermann reaction will enable us to dispense with much neurodiagnostic lore and skill, but the installation for this is very complicated, and therefore not available except in certain large centers; in any case, a certain knowledge of neurological signs is required before one can even suspect an incipient tabes or paresis.

Noguchi has recently discovered a very simple reaction of the cerebrospinal fluid, which he believes to be pathognomonic of dementia paralytica at least. It is certain that if it will reveal paresis it will reveal tabes equally well. Noguchi claims that his test succeeds in a larger percentage than that depending upon the Bordet-Gengout principle. It is as follows: To 0.1 Cc. of spinal fluid in a tube of not over one centimeter diameter add 0.5 Cc. of 10-per-cent butyric acid; heat till bubbling, and while hot add 1 Cc. of 4-per-cent sodium hydrate solution. In a few moments the paretic fluid becomes flocculent, whereas normal fluids are only opalescent or cloudy; the flocculence does not depend upon the quantity of the cloudiness, but is characteristic of metasyphilis.

When the diagnosis is made, the manner of treatment outlined will remove from the radicular nerves the infiltrations and exudates caused by the lues. If intervention is early, absorption occurs without cicatrix; and the lost conductivity of the nerve fibers, which always precedes destruction, is quickly restored. The invasion of other regions is forestalled, and the general health of the patient is improved.

Space lacks to insist upon the accessory, though essential, hygiene and dietetic factors of successful treatment; but they cannot be too strongly insisted upon. The author gives all his patients a dietary and an elastic time table, by which to regulate their day; and he prescribes their exercise, in order that this essential metabolic regulator may be procured without undue fatigue.

It would seem inevitable that if this treatment can arrest the tabetic process it should not fail to put an end to the inflammatory invasion which determines dementia paralytica; for it is clear that the two processes are etiologically and pathogenically the same, differing only in locality. The future will show whether this expectation is realizable in practice. It would seem that the problem is one of diagnosis early enough to anticipate the loss of resistance due to the massive invasion of the encephalon in paresis.

In this diagnosis, as well as in the prognosis, psychometric methods are of great assistance. Some pathologists will reply to this belief by calling the cases which recover cerebral syphilis, diffuse, arteriosclerotic, or gummatous; but the research of Ladame has shown the impossibility of drawing the histological line between diffuse syphilis and paresis. Moreover, neurological surgeons know how resistant are gummata of the brain to antiluetic treatment; while syphil-

itic arteritis is irremediable after sclerosis has occurred. The therapeutic difference does not seem very distinct, and we must fall back upon the unequivocal evidence of the serum reaction, which declares that paresis is syphilitic, and as such must be amenable to a specific therapy, as the author maintains. We have only to find the pharmacodynamic way; and it is in order to appeal to the practical trials which will eventuate in a precise method *secundum artem* that the author finds it an agreeable duty to present, as he sees them, the main trends of progress in the effective therapeusis of the hitherto hopeless Frascatorian encephalitic and spinal meningitides.

THE VALUE OF ADRENALIN IN SURGICAL ACCIDENTS.

CRILE in a paper on surgical anemia and resuscitation published in the *American Journal of the Medical Sciences* for April, 1909, says that the value of adrenalin in raising the blood-pressure, by its action upon the vascular walls in the state of suspended animation, has been thoroughly established. Introducing the adrenalin into the venous circulation, while easy and practical, had the following disadvantage: the adrenalin first came in contact with the vessels having the least power of influencing the blood-pressure, and before a material rise could be effected by its action upon the arteries it was necessary that the solution should pass through the right heart, the lungs, and then back to the left heart on its way to the aorta, then finally affecting the coronary arteries. In a previous research it was found that this too often caused an accumulation of solution and blood in the dilated paralyzed chambers of the heart, defeating resuscitation.

It seemed reasonable to suppose that the most direct and effective way of producing a coronary pressure amounting to 40 or more millimeters of mercury was by introducing a solution of adrenalin into the arterial system toward the heart. In this way the moment the adrenalin was introduced it caused a contraction of the strong arterial walls, and began to produce an arterial pressure which was communicated directly to the coronary arteries without first passing directly through the already distended and paralyzed chambers of the heart and through the lungs. These considerations were strongly impressed upon the author by a clinical case of suspended animation in the course of a cerebellar operation on a child, which was unexpectedly resuscitated by centripetal arterial infusion of adrenalin.

The following will serve as an illustration: An animal was killed by chloroform. A cannula was inserted into the femoral artery and directed toward the heart. After five minutes artificial respirations were begun, and the saline solution was given into the tube near the cannula. A few seconds later the blood-pressure began to rise steadily; then a few firm pressures upon the thorax over the heart caused a leaping up of high pulse waves, and at the end of three-quarters of a minute the heart beat vigorously, driving the blood up into the infusion bottle, which had been to the height of five feet. The saline injection and the cardiac massage were discontinued, and in a few minutes irregular respirations began slowly, and increased in force and frequency until the normal was established. The animal was then definitely killed.

In general the following sequence of return of the various functions and reflexes was exhibited: vasomotor action, respiration, corneal reflex and knee-jerk (tendon reflexes in general), winking, cutaneous reflexes, partial or complete contraction of the pupils, and light reflex.

THE VACCINE TREATMENT OF ACNE.

The *Lancet* of April 10, 1909, points out that many of the diseases of the skin are especially suitable for the accurate estimation of the value of new methods of treatment, for the daily variations are open to examination. Should the inflammation increase the fact is at once patent, for the redness and the dilated vessels are visible, and there is no need to employ physical

methods to ascertain the fact; on the other hand, should the inflammation subside, the diminution of the vascular supply of the part is at once evident. Even the amount and character of the exudates from the vessels of the skin can be appreciated in a way impossible with diseases of other and deeper structures. One of the newest and most valuable methods of combating microbial disease is by the administration of vaccines, and some of the diseases of the skin have proved very amenable to this mode of treatment. The vaccine treatment has yet another value: It may serve to determine etiological questions. If a patient is suffering from a disease in which the presence of a microörganism has been detected, the effect of the employment of a vaccine may suffice to determine whether that microorganism has or has not a share in the production of the disease. Moreover, when two organisms are found to be present in many cases of an affection, the administration of a vaccine prepared from one or other of these microbes may indicate the relative importance of the two microbes as etiological factors.

In a recent issue of the *Lancet* appeared a paper by Dr. Alexander Fleming, of St. Mary's Hospital, on the "Etiology of Acne Vulgaris and its Treatment by Vaccines." The cause of acne has been discussed for many years, but without the formation of any very definite ideas as to its real mode of production; it is sufficient to read the long list of causes mentioned in most of the textbooks to recognize that the essential cause is not among them, although each of them may occur in one way or another as an etiological factor. Unna in 1893 was the first to demonstrate a special bacillus in cases of acne, and he named it the acne bacillus. He found it constantly present in sections and smears of comedones and acne pustules; moreover, it was the only organism which could always be found, and it was present in greatest number in the deeper parts of the comedo. Four years later Sabouraud described the bacillus as occurring in sebaceous plugs of seborrheic skins, and he claimed that it was the cause of seborrhea and of alopecia areata. It is probable that this inclusion of alopecia areata in the effects of Sabouraud's bacillus retarded the recognition of its etiological value in seborrhea and acne, for the clinical characters of alopecia areata are sufficient to exclude it from a group containing the two other diseases. The general feeling among dermatologists with regard to Sabouraud's bacillus was that, though it was possible that it was the cause of seborrhea, it was not proved that it had anything to do with alopecia areata or with acne.

In 1899 Gilchrist of Baltimore described a bacillus constantly found in acne, and in one-third of the cases it was obtainable in a pure culture from acne lesions. He named the organisms "bacillus acnes," and looked upon them as differing from Unna's bacillus, but most of those who have examined the question agree in thinking that Gilchrist's bacillus acnes are identical with Unna's acne bacillus and with the bacillus described by Sabouraud. The absolute regularity with which the bacillus can be found in cases of acne vulgaris suggests an etiological relationship between them, but mere coincidence of occurrence cannot prove that the bacillus is the cause of the disease. However, the opinion is distinctly gaining ground that the bacillus is the *causa causans* of acne, although there may be other etiological factors.

A further problem awaits solution. Even if it be admitted that the acne bacillus gives rise to the comedo, is it also the cause of the pustules which are the almost invariable accompaniment of a case of acne? Can the acne bacillus cause suppuration by its own unaided efforts, or does it need to invoke the aid of ordinary pyogenic organisms to give rise to acne pustules? Opinions differ. Unna considered that the bacillus was the cause of the pustules, for in his opinion the histological characters of the pustules differed from those found in ordinary staphylococcic pustules. Sabouraud thought the suppuration was due to a secondary infection with pyogenic organisms. Gilchrist

found that even from the pustules a pure culture of the bacillus acnes could be obtained in a good proportion of the cases examined, and therefore he considered that the pustules as well as the other lesions of acne were caused by the bacillus. Whitfield from his own researches concluded that the comedo is caused by the acne bacillus, but he looked upon the pustule as due to a secondary staphylococcic infection. In this position the matter rested; without some fresh light, some fresh method of investigation, it seemed to be impossible to give a decisive answer to either question: first, whether the acne bacillus causes the comedo, and secondly, if it does cause the comedo, does it also cause the pustule?

The answer to these questions may be supplied by the vaccine method of treatment, and if so it is to be found in Dr. Fleming's paper to which we have already referred. In the first place, he concurs in the almost invariable existence of the bacilli in the comedones, and he finds that they are also almost always present in the pustules. The bacilli grow with difficulty on artificial media, but in many cases a pure culture was obtained by Dr. Fleming even from the pustules. So much for the constancy of the organism. A pure culture of the bacillus proved capable of producing a folliculitis on the forearm of a susceptible person. In five days definite pustules appeared, and when the pus from them was examined only the acne bacillus could be seen. Further evidence is to be found in the fact that the serum of patients afflicted with acne agglutinates the bacillus in some cases. Sir Almroth Wright showed in 1902 that carefully prepared vaccines derived from the infecting organisms produce a definite beneficial effect. Dr. Fleming's chief contribution to this important subject is the showing that a vaccine prepared from the acne bacillus alone, or in certain cases in combination with a staphylococcus, is capable of effecting a remarkable improvement in the condition. In most cases of acne a stock vaccine of the acne bacillus gives extraordinary results when employed in suitable doses; an excessive dose is followed by a negative phase and the outbreak of a fresh crop of pustules; when the dose is reduced sufficiently improvement follows. In some cases it appears to be necessary to prepare a vaccine from the acne bacillus present in the individual patient, but this is exceptional.

From a consideration of these facts described in detail in Dr. Fleming's paper we are justified in concluding that the acne bacillus is the essential causative factor in acne vulgaris, and that by its own unaided efforts it is capable of producing a pustular eruption, but that in some cases the suppuration may also be caused by a secondary staphylococci infection. The investigation conducted by Dr. Fleming is very complete, and perhaps settles a question which has for many years disturbed the dermatological world.

TREATMENT OF CHOLERA.

In the *Medical and Surgical Journal of the Tropics* of March 15, 1909, CHUNDRA gives the following advice as to cholera:

Stage of Invasion.—During this stage don't try to check vomiting and purging because it is nature's method to drive out the poison from the system. The following are the best combinations:

1. Saturated solution of camphor in chloroform. Drop doses in a lump of sugar every quarter or half an hour up to four or five doses.

2. Liq. hydrarg. perchloride, m. x-xv; spt. camphor, m. v; spt. chloroform, m. x; aquæ anisi, q. s. ad ½ ounce. M. for a dose. Sig.: One dose every hour up to two or three doses.

Shake the vial well before use.

3. Chlorodyne in brandy.

Whatever combination you may select, wrap up well the patient in a blanket. Remove all sources of irritation; make the room dark; fan his head gently. If this induces sleep, you will find him much better after waking up; it may even cut short the disease.

Stage of Development.—During this stage continue the medicine as mentioned above

except chlorodyne, but at the same time treat him symptomatically.

(*A*) Vomit.

Internally: (1) Hydrarg. subchloride, gr. 1/6; sodii bicarb., gr. ij; every hour up to three or four doses. (2) Cerii oxalas effervescent. Dose, a teaspoonful every hour up to two or three doses. (3) Thick barley water with lemon juice. (4) Drop dose of vinum ipecac; every hour up to two or three doses. (5) Chloretone, gr. ij; every hour up to three doses. (6) Hot coffee acts sometimes miraculously when other medicines have failed.

Locally: (1) Mustard plaster 6 by 4 inches over epigastrium. (2) Mustard plaster 2 by 1 inches just outside the angle of jaw over the anterior margin of sternomastoid muscle to stimulate vagus.

(*B*) Diarrhea. Give per mouth, bismuth subgallate, gr. v-x; tannigen, gr. v; salol, gr. ij; pulv. cretæ aromatic, gr. x.

Per rectum give weak solution of tannic acid in whey, which is highly beneficial; it is used for its antiseptic and not for its astringent property.

1. Don't give opium in any shape during this and subsequent stages, because it is not absorbed during the collapse stage; and when the patient passes to the stage of reaction as absorption sets in, he may die from opium poisoning rather than from the disease itself.

2. Don't give powerful astringent enemas for checking diarrhea at once and thereby make yourself ridiculous.

For vomiting and purging the application of spinal ice-bag over the vertebral column soothes the sympathetic system and thereby abates vomiting and purging.

(1) Hot bottles on the body. Wrap up the bottles carefully; don't blister the patient, as sensation is much impaired during this stage. (2) Hot blankets over the body. (3) Rub extremities well with the following: Powdered mustard, powdered ginger, powdered violet, ää 1 ounce.

Treat the patient symptomatically.

Thirst: (1) Iced champagne and soda water. European patients like this very much. (2) Iced cocoanut water. (3) Iced palm water. (4) Rice-water iced. (5) Iced orange to suck.

Cramps: (*a*) Inhalation of chloroform. It must be administered by a medical man. It is dangerous to allow laymen to have chloroform at hand. (*b*) Locally (1) Rub one powdered nutmeg in turpentine; mix it with little warm water; rub the affected limbs well. (2) Liniment of belladonna, liniment of chloroform, liniment of menthol, liniment of soap, ää 1 ounce. M. S.: To be rubbed well. (c) Internally give atropine sulph., gr. 1/100; but it is to be used with caution.

For delirium give trinitrine every two hours up to three or four doses.

Suppression of urine: (*a*) Locally (1) Cupping on the loins. (2) Constant application of bran poultices over the loins. (3) Passing a soft catheter per urethra mechanically irritates the urinary system and thereby aids the flow of urine from kidney to bladder. (*b*) Internally give tincture cantharides in drop doses. Or potassii acetas, gr. x; spt. ether. nitrosi, m. xx; spt. juniper, m. xx; inf. buchu, q. s. ad oz. j. M. Sig.: Give this every two hours up to three or four doses.

Stage of Reaction.—A diffusible stimulant is the best: Spt. ammon. aromatic, m. x-xx; spt. chloroform, m. x; inf. digitalis, dr. j; tinc. musk, m. x-xx; inf. scop. q. s. ad oz. j. M. Sig.: Give this every three hours up to four or five doses. Treat complications according to symptoms.

Dietetic Treatment of Cholera.—During stages of invasion, development, and collapse, stop giving all diet except iced cocoanut water and sodii chlorid., gr. iv; acid. hydrochloric. dil., m. x; iced aq. anisi, q. s. ad O j; dose *ad libitum*. Fresh fruit juice—*i.e.*, pomegranate, grape, etc. Freshly made raw meat juice may be allowed with discretion.

N. B.—Don't give milk in any shape during these stages. Don't give the white, muddy part of ice, which is the very cradle of germs and impurities; give freely bits of the crystalline part of ice to suck. Don't

hesitate in giving water freely in some shape or other. The more you give the patient to drink, slowly but cautiously, the more the man eliminates toxin from his system.

During the stage of reaction prescribe for the patient the undermentioned altered form of milk: Take pure warm milk, add fresh lemon juice, filter it, add a pinch of common salt to the filtrate. Dose *ad libitum*.

VENOUS ANESTHESIA.

The *Medical Record* of April 10, 1909, tells us that the inventive mind of August Bier has added another technical procedure of apparently great importance to the art of medicine. It is the production of local anesthesia by the introduction of the anesthetic into the veins of an extremity, a method which he presented for the first time last year at the Congress of the German Surgical Society, and to which he devotes a comprehensive paper in the *Berliner klinische Wochenschrift* of March 15, 1909.

His experience with simple local anesthesia has shown that the sheaths of nerves offer great resistance to the entrance of an anesthetic, a fact which well explains the difference between the effectiveness of a local anesthetic injected into the tissues and the same drug introduced into the spinal meninges. Lumbar anesthesia, however, has almost as many disadvantages as inhalation narcosis, while local infiltration anesthesia but seldom allows large operations to be performed painlessly if bones or joints as well as soft tissues are involved. Moreover the quantity of the drug used in producing infiltration anesthesia is sometimes large enough to introduce the possibility of dangerous toxic effects.

Venous anesthesia consists in the introduction of the anesthetizing drug into the veins of an extremity which has previously been made as bloodless as possible by tight bandaging; two bandages are used, and the drug is introduced into the veins between them. Bier differentiates between "direct" anesthesia produced between the two bandages and "indirect" anesthesia which occurs somewhat later, and which robs of sensation all of the limb below the bandages. The individual circumstances of each case determine which method is to be used, the bandages being adjusted either to include the field of operation between them or to have all of it below the lowermost bandage. Using either of these methods Bier has performed ten amputations, thirty-seven resections, and a great number of smaller operations upon the soft parts, the bones, and the joints of the extremities. Among the total one hundred and thirty-four operations, the anesthesia was unsuccessful in only five cases, three of them occurring in children, in whom all local anesthesias are, of course, uncertain procedures. The only possible contraindication Bier sees is in cases of diabetic gangrene, inflammation and gangrene having developed in the amputation stumps of three diabetic subjects after operation under venous anesthesia. It was not improbable, however, that a like result would have occurred in any case.

Bier acknowledges that there is much room for improvement in the anesthetic solutions used by him and in the general technique of the procedure. He seems to have no doubt, however, that this method of producing extensive local anesthesia is the best that has so far been devised.

MODERN METHODS OF TREATMENT OF SOME COMMON SKIN DISEASES.

In the course of an article with this title BUNCH, in the *Lancet* of April 3, 1909, tells us that the use of liquid air and liquid carbonic-acid gas, Bier's local hyperemia, electrolysis, and ionization have all given us new weapons to fight diseases of the skin, to say nothing of the excellent results obtained by vaccine treatment and by the use of *x*-rays. *X*-rays have apparently a selective action for hair papillæ, cancerous cells, and pathological tissues in general. Thus a portion of scalp which has been exposed to a definite dose of *x*-rays becomes entirely bald at the end of three or four weeks, and then new hair grows again over

the bald area after another period of twelve weeks. In the case of ringworm of the scalp, the diseased hairs become loose and fall out, and are succeeded by a fresh crop of hair entirely free from disease. The patient is thus entirely cured of his ringworm by a single exposure of the diseased patches and can return to school without danger of infecting other children. The only essential is that the amount of the *x*-ray dose shall be accurately measured, and by this the author does not mean the amount of current passing into the tube, but the amount of *x*-rays reaching the scalp. This is effectually done by means of greenish pastilles of platinocyanide of barium interposed between the tube and the scalp, which change to a brownish tint when the exact dose has been given. Children are not frightened by this method of treatment, and for children over four years of age there is no question that better and quicker results are obtained in this way than in any other, always assuming that the scalp has not been previously irritated by treatment. It must, however, be remembered that the rays do not kill the fungus, and the diseased hairs may, as they fall out, infect other healthy portions of the scalp. The writer therefore always makes a practice of applying a weak sulphur and carbolic ointment over the whole scalp every morning in order to avoid any such possible infection.

Cases which have already been irritated by treatment or for other reasons are unsuitable for the application of *x*-rays are best treated by a croton oil ointment, applied daily with frequent bathing with hot water, or by either of the following: (1) Chrysarobin, gr. xxv; acidi salicylici, gr. x; ichthyol, gr. xx; and adipis benz., ℥j. (2) Olei rusci, ℥j; saponis mollis, ℥jss; and spt. lavand., ℥j. (3) Naphthol, gr. ij; sulph. precip., gr. xlv; balsam Peru, gr. v; and lanolin, ℥j.

A new method which is claimed to cure ringworm in from two to three months is to clear the patches thoroughly by epilation and washing, and then to cleanse them with the following solution: Boric acid, gr. v; chloroform, m. xx; and spt. vini rect., ℥j. Then rub in acetic acid in crystals, gr. iv; and solution of hydrarg. perchlor. (1 in 1000), ℥j. Finally cover with acetic acid, gr. iv, unguentum cinerei, ℥j. When as a result of treatment there remain but a few scattered stumps or black dots the writer destroys them either by electrolysis or needling with croton oil colored with methylene blue. The dye enables one to see which stumps have been treated, and their removal two days afterward with forceps is an easy matter.

Tinea circinata, or ringworm of the nonhairy skin, is easy to cure—quite a different matter from ringworm of the scalp. An ointment of ammoniated mercury, or sulphur, ℥ss, acidi salicylici gr. x, naphthol gr. iij, and vaselin ℥j, rubbed in twice a day, will effect a speedy cure.

While speaking of diseases of hairy regions the author refers to a common cause of mental worry in sensitive women—hypertrichosis, or superfluous hair. We all know what a depressing effect a slight mustache or beard produces in some women, how often their thoughts recur to it, and how sensitive it makes them in the presence of strangers. When the hairs are few in number, but large and pigmented, it is the author's belief that no method is equal to electrolysis. When there is merely a soft down the writer recommends the application of a barium sulphide paste such as the following: Barium sulphide, gr. xij; powdered soap, gr. xv; starch powder, gr. xv; and benzaldehyde, ℥j. This if applied from time to time when the hairs grow up again from the papillæ is quite sufficient to keep the growth under. In order to avoid the possibility of a resulting dermatitis the paste should not be applied for more than five minutes and then washed off.

The use of *x*-rays, although of course they make the hair fall out, has not until recently proved a success in hypertrichosis, but quite lately Noire of Paris has devised a method by which only those rays are allowed to act upon the skin which affect the hair papillæ. This he accomplishes by in-

troducing between the tube and the skin a plate of aluminum four-tenths of a millimeter in thickness. The exposures are made at intervals of a fortnight, and at the end of a fortnight after the first exposure the hairs are found to be clubbed, thin, and depigmented at the base, but they have not fallen out. A fresh application is made, and in from eight to ten days afterward a certain number of hairs begin to fall out. Four or five applications are made, and by this time all the hairs will have fallen out. Two more exposures are made at intervals of a month, and after two months a slight regrowth commonly occurs, representing about one-tenth of the fallen hairs. Two or three new applications will cause these to disappear, and this time finally. The method is especially suitable to those extensive beards involving both cheeks and the chin, which are a source of the greatest mental discomfort to the patient, are a distressing deformity, and cannot be satisfactorily treated by any other method.

DIPHTHERIA.

In the *Intercolonial Medical Journal of Australasia* of February 20, 1909, MACKAY and O'BRIEN deal with 404 cases showing Klebs-Loeffler bacilli in smear from culture tubes, admitted from January to November, 1908, practically all of which were treated by Dr. Mackay during his tenure of office as medical superintendent; the few others included were cases treated during Dr. O'Brien's temporary superintendentship when these statistics were collected.

The main conclusions regarding treatment arrived at by the authors from this series of cases are:

Provided no complications are present, the best control for the administration of diphtheria antitoxin in faucial cases is the patient's temperature. They gave antitoxin in such dosage, repeated at eight to twelve hours' interval where necessary, that a fall in temperature to the normal line was produced. Practically none of their charts, except those few cases in which complications existed, show a temperature range above normal after the second day. Their average dose of antitoxin was high, but their results were most satisfactory, as evidenced by the comparatively low death-rate, early resolution of the membrane, and low percentage of resulting albuminuria.

Gentle swabbing, douching, and gargling of the throat with simple saline solution, accompanied by mild oral antisepsis, is more efficient and much less distressing than vigorous swabbing and gargling with strong antiseptic solutions, whose tendency is to abrade the mucous membrane, and so produce a fresh raw surface for the spread of the diphtheric membrane.

Their experience has led them to strongly favor intubation as the routine hospital operation in cases of laryngeal diphtheria. Their procedure has been first to try an initial dose of antitoxin, say 20,000 units, accompanied by external applications of heat to the throat; if that failed, then to intubate, probably giving more antitoxin; and finally, if failure again, to do tracheotomy as a last resort, the child getting 40,000 to 50,000 units of antitoxin.

TREATMENT OF CHRONIC ECZEMA.

In the *Lancet* of April 3, 1909, BUNCH reminds us that in chronic eczema, with considerable thickening of the epidermis, we have to consider methods of treatment energetic and stimulating. The chronic infiltration which extends into the deeper layers of the epidermis, the dilatation and alteration of the lymphatics, and the chronic edema of the skin are indications for the application of medicaments which will increase the flow of lymph and, as far as possible, disinfect the diseased area. Massage of the thickened skin is often of service, followed by the application of salicylic acid plasters or ointments, or tar preparations such as oil of cade or liquor carbonis detergens. For old chronic thickened eczema plaques the author uses chrysarobin or pyrogallol in from 1- to 10-per-cent oint-

ments made up with vaselin and painted on, followed by the plentiful application of zinc and starch powder. When the patches are greatly thickened they may be softened by the painting on of 50-per-cent liquor potassæ, then applying 50-per-cent silver nitrate solution and covering with sterile gause for one or two weeks until healed. The scab is then removed by treating with boric ointment. Pastes containing lenigallol prove of service in many cases, and they can be combined with sulphur or oil of cade. A paste containing the latter is as follows: Lenigallol, gr. xl; oil of cade, m. xx; zinci oxidi, ℥iss; kaolin, ℥iss; and vaselin, ad ℥j.

The especially rebellious eczemas of the scrotum, anus, and vulva are best treated by the Paquelin cautery under general or local anesthesia and the subsequent application of 5-per-cent solution of borax compresses. Light treatment has given good results in some cases, especially in localized eczematous plaques, and in certain cases applications of radium. But it is important in both cases to give only minimal doses and to avoid any possible overexcitation of the inflamed skin. The irritability of the skin can also be diminished by applications of blue light by means of the blue quartz lamp or the uviol lamp. High-frequency currents have also been recommended, but as to their beneficial effect the author is somewhat skeptical.

One of the most troublesome symptoms of eczema is unquestionably the itching, and although this diminishes as the inflammatory hyperemia lessens, we often need some more rapid means of checking it. Cold-water compresses are often of service, and any harmful effects of the water can be minimized by subsequent applications of drying powders, but menthol suits some cases even better. Two- to ten-per-cent solutions in alcohol or oil are the best means of applying it, but the resulting sensation of cold is sometimes felt to be worse than the itching. Then one- to two-per-cent solutions of salicylic acid in alcohol may be tried, or carbolic glycerin made up as follows: Carbolic acid, gr. iv; glycerin, m. xl; and spt. vin. rect., ad ℥j. This is to be applied on cotton-wool or a sponge. The possible irritating effect of the carbolic acid must be watched, but if it can be borne the effect on the itching is sometimes wonderful. Cocaine and eucaine solutions the author has also found to be of use in some cases.

So far the writer has dealt only with the external treatment of eczema, and has intentionally laid stress on the external as opposed to the internal treatment of the disease. Not that he does not attach importance to the internal treatment, but because he believes that it alone cannot cure eczema and is only of value in conjunction with direct applications to the diseased area. Obvious dyspepsia, rheumatism, gout, or anemia must be treated, and the question of diet must be gone into carefully. All alcohol is undoubtedly bad for eczema, and so is tea in dyspeptic patients. Highly seasoned dishes must be forbidden, and an acute attack of eczema in a patient who habitually lives too well is an indication for saline aperients. In those cases in which the coagulation time of the blood is delayed calcium salts should be ordered, and food containing vegetable acids such as tomatoes and rhubarb forbidden. Arsenic has, of course, a considerable reputation, but it should only be given in chronic cases, and then for a period of a month in increasing doses up to 30 minims a day, and then diminished during the succeeding fortnight, at the end of which it should be stopped for a time.

THE TREATMENT OF SCABIES, OR COMMON ITCH.

Bunch states, in the *Lancet* of April 3, 1909, that when he sees a general eruption, scratched or pustular, and when the patient complains of itching, he always looks for burrows, whoever the patient may be. If he can demonstrate an acarus there can be no question of the diagnosis, and he does not consider it within his province to inquire from whom the acarus came. It is a fact, however, that one variety of mange

in the dog is due to an acarus which may infect man, and persons who have much to do with dogs may become infected in this way. The face is always affected in these cases, whereas ordinary scabies does not cause any lesions of the face in adults.

The treatment of scabies aims essentially at opening up the burrows, destroying the acari, and allaying the itching. The best way is to make the patient soak in a hot bath for a quarter of an hour, then scrub himself with soft soap, using a nail-brush for the hands and feet. After washing off the soap the sulphur ointment of the Pharmacopœia is rubbed all over the skin, except the face, and left on for three days. The patient then has a starch bath to allay the irritation and applies boric ointment to any patches of dermatitis which may be present. It is important not to use any sulphur after the third day, otherwise an unpleasant degree of eczema or artificial dermatitis may be set up which will cause great itching. In place of sulphur, B-naphthol in 20-per-cent ointment may be rubbed in after the bath and again on the three following days. It has the advantage that it is odorless and cleaner than sulphur, but it is not so efficacious. The same may be said of balsam of Peru, and the writer prefers to order sulphur. In any case, the clothes must be disinfected and the patient kept under observation for ten days to make sure that all ova have been destroyed.

PUERPERAL ECLAMPSIA.

Crago in the *Australasian Medical Gazette* of February 20, 1909, reminds us that fortunately albuminuria in a pregnant woman does not always spell eclampsia. During his connection with a maternity hospital, as well as in private practice, the author has seen very many cases of albuminuria in pregnant women (in some the urine was almost solid on boiling) who did not develop eclampsia. He knows of no means of deciding beforehand which patient will develop eclampsia and which not, although probably the one most subject to headaches and nervous restlessness is more liable to do so. Although the amount of albumin in the urine before the onset of the convulsions may be very slight, in most cases the urine becomes solid with albumin afterward. The author does not deal with the many theories as to the causation of eclampsia, beyond saying that most authorities agree that it is a toxemia. The onset is always sudden, and in most cases probably the medical attendant called in has not seen the patient before. The main principles of treatment to be followed are: (1) To control the convulsions; (2) to empty the uterus, if the attack be antepartum; (3) to endeavor to insure the eliminative action of the bowels, the kidneys, and the skin. The two chief methods of checking the fits are (*a*) the administration of chloroform, and (*b*) the hypodermic injection of morphine.

The writer has an objection to keeping a patient under chloroform for a long time in this condition, as it tends to increase congestion of the kidneys. For many years he has trusted almost entirely to morphine to control the fits, giving at first half a grain, and repeating a quarter of a grain every three or four hours if necessary. In cases of eclampsia the os generally dilates very rapidly, as if nature was making an effort to empty the uterus, so that on making a vaginal examination the os is found dilated to the size of a half-crown, or a crown piece. If the patient is not comatose a little chloroform should be administered, and the cervix dilated either manually or with a Bossi's or other dilator. As soon as the os is dilated to the size of the closed fist, the child should be delivered either with forceps or by podalic version. The placenta should be quickly peeled off and the uterine cavity douched with hot saline solution. The bowels are acted upon by enemata or by placing a drop or two of croton oil on the tongue in butter. The skin and kidneys are stimulated to action by wrapping the patient in a blanket wrung out of very hot water. A pint of normal saline solution should be run in under each breast. When the patient is able to swallow, water or barley water may be given free-

ly. The author bled three out of four of his earlier cases over twenty years ago. They all recovered, but one symptom remained for a long time in evidence, viz., a forgetfulness of everything that had occurred before the illness.

SOME TRUTHS ABOUT HYDROTHERAPY.

In the course of an article in the *Boston Medical and Surgical Journal* of April 15, 1909, BARUCH reminds us that the cold bath, indeed, every cold procedure, has for its chief object the enhancement of the resisting capacity of the patient to the disease. In an acute disease like typhoid fever this is accomplished, first, by the well-known primary effect of cold in contracting the cutaneous vessels. This is followed by reaction, which is manifested by a tonic dilatation of the vessels, whose walls had previously been in a semiparetic state by reason of the prevailing toxemia. The heart is thus materially aided in its labor to overcome the unresponsive condition of the peripheral vessels. Heart failure, which stands as a specter at the bedside of every case of infectious fever, is not due so much to enfeeblement of the cardiac muscle by hyperpyrexia as to the imperfect action of the peripheral vessels, which allows the blood to glide through them without resistance. Cold water applied with friction stimulates the cutaneous arterioles to a more nearly normal action; it increases peripheral elasticity and resistance and enables the heart to renew its energy. Arterial tension is increased, the danger of failure of the laboring heart is overcome.

The excitation of the terminal filaments in the skin which follows the repeated impact of cold water is rapidly conveyed to the central nervous system and thence reflected upon the life-maintaining organs whose functions have been more or less impaired by the existing toxemia. Each bath or other cold procedure gives a fillip to the depreciated nerve centers and sends new life to the organs depending upon them. The whole machinery of the organism receives a refreshing impetus, the impression being more or less enduring according to the temperature, duration, and procedure to which the patient is subjected. All this is now recognized by the well-informed physician, and yet nearly every text-book refers to the cold bath under the caption of heat-reducing agents, and few emphasize the truth that the correct cold bath is an antifebrile remedy which meets in fevers all therapeutic indications, of which temperature reduction is only one. A far more important truth than this even still appears to lack appreciation, viz., that the cold bath is not a symptomatic remedy, but that its value is due to the prophylactic action in infectious fevers.

It has been clearly demonstrated by large bedside observations that the early and correct application of hydrotherapeutic procedure in fever prevents complications and saves lives by removing from the causes of death heart failure, perforation, hemorrhages, and hypostases. Upon the recognition of the prophylactic effect of judicious bathing begun in the first week of typhoid fever the Brand method is based, and only to the neglect of this principle is due the failure of the latter. That thousands of lives have been saved by the correct application is evident from Vogl's statistics, the reports of the German army, and their corroboration in our country by Peabody, Loomis, Osler, Thompson, and Baruch. Dr. Gilman Thompson states in his text-book on Practice that the mortality of typhoid fever was reduced from 16 to 6 per cent in the Presbyterian and in the New York Hospitals since the introduction of the Brand bath, and the late Dr. H. P. Loomis reported to the Practitioners' Society of New York, in 1903, that the mortality from typhoid fever in the principal New York hospitals had been reduced 50 per cent since the introduction of the systematic use of the Brand bath. Bear in mind that the evidence is furnished by professors of medicine in two large medical schools. Comparing the number of deaths from this disease in previous years, it may be safely

computed that 1000 lives have been saved in New York City alone by the correct application of water in one disease. If it be borne in mind that private practice, in which bathing may be begun earlier than in hospitals, where patients are brought in late in the disease, offers a far more favorable field for this treatment, it becomes quite apparent how many lives are sacrificed by the neglect of this procedure.

THE TREATMENT OF ECLAMPSIA.

WALLACE in the *New York State Journal of Medicine* for April, 1909, gives the following directions for the treatment of eclampsia:

1. Alleviate the convulsions, if deemed necessary, with a narcotic, avoiding drugs like chloroform, which disorganize the liver and depress the patient; remembering that she needs oxygen by artificial respiration.

2. Stop the production of more poison by emptying the uterus as rapidly as is possible without having our efforts do more harm than good.

3. Combat the poison in the blood which is threatening to kill the patient.

Avoid concentrating the poison. The fluids must not be reduced faster than the poison is eliminated. When nature cannot carry off the poison fast enough she stores all the water possible in order to dilute it, and the patient is edematous. If much edema is present, hot packs are particularly dangerous, as the sweating will concentrate the poison and induce convulsions.

Dilute the poison by adding fluids to the blood by salines. If intravenous salines are used, from one to three pints only must be given, as more will drown the patient.

Eliminate the poison by washing out the stomach and rectum and the blood. These patients are constipated. There is an obstruction of the bowels even until the stomach is full of the backflow of the toxic materials. Washing out the stomach is on a par with artificial respirations and must not be neglected. The tubing from a fountain syringe may be used if no stomach-tube is at hand.

Administer hot, thoroughly diluted Epsom salts solution through the tube if the patient is unconscious. This will be rapidly absorbed by the stomach and the bowels will soon move.

Bleed if necessary to prevent impending apoplexy or pulmonary edema and to abstract some of the poisoned blood, replacing it by salines by venous transfusion. The abstraction of a pint of blood removes a portion of the poison and makes the blood vessels hungry for the diluting salines. If circumstances will permit, a venous transfusion will save many comatose cases which are in extreme condition.

The idea that the usual treatment of eclampsia is too violent is not new or original. Even before the pathology of eclampsia was understood, when the kidneys were supposed to be the seat of disease, many obstetricians protested against the treatment with chloroform and violence as too fatal to be allowed, and much more fatal than no treatment. In spite of our knowledge that the convulsions and edema are only symptoms and that the kidneys are no more the source of the trouble than the damaged eyes, we still find ourselves tempted to direct our efforts against the kidneys and the convulsions, forgetting all we know about the pathology of the disease.

THE TREATMENT OF CANCER OF THE STOMACH.

HALE WHITE in the *British Medical Journal* of April 3, 1909, states that in rather over 60 per cent of the cases of carcinoma of the stomach the growth is at the pylorus, and in a considerable number of such cases there is a consequent obstruction to the exit of food from the stomach. Percussion without artificial distention is an uncertain means of estimating the size of the stomach, and a little succussion is fallacious; therefore these signs should not be relied upon in determining whether the patient has some gastric dilatation as a result of pyloric obstruction, but if a patient is given some bread and milk mixed with bismuth oxychloride and then examined in

a vertical position by the *x*-rays with a screen, delay in the passage of the bismuth through the pylorus may readily be seen; and indeed probably the bismuth method may sometimes help us to discover a growth in other parts of the stomach, for the passage of the bismuth in a normal stomach is such a regular uniform motion that, if any of it adhered to the growth or this impaired the regular contraction of the stomach, we might see the unusual movement of the bismuth on the screen.

An examination by the *x*-rays may be of great help in the diagnosis of cancer of the stomach, but too much reliance must not be placed upon it as a means of estimating whether the organ is dilated, for the position of the lower border of the stomach is very variable in health. Vomiting large quantities at a time of sour material is evidence of gastric dilatation, but we ought to try to diagnose these cases before the quantity is excessively large. Lactic acid in the vomit indicates pyloric obstruction, for it shows that the gastric contents have remained in the stomach long enough to decompose, and this too is the significance of the Oppler-Boas bacillus. Visible peristaltic movements of the stomach, generally best elicited by flipping the abdominal wall, are a valuable sign, for, as they indicate hypertrophy of the gastric muscle, if they are present we may often infer that the pylorus is obstructed. Dilatation of the stomach may, too, be made out by percussing the organ before and after the patient has swallowed a solution of bicarbonate of soda followed by some lemon juice. With regard to all these symptoms of dilatation of the stomach, it must be remembered that in order to diagnose gastric carcinoma from them we must show that pyloric obstruction is the cause of the dilatation; hence the value of the bismuth method and visible peristalsis.

Even when the growth cannot be removed, or secondary deposits render this undesirable, much benefit often follows a gastroenterostomy if there are signs of pyloric obstruction. The vomiting ceases; the patient digests his food better and gains weight. Life will be prolonged partly for this reason, and probably because some of the gastric contents will no longer pass over the growth; hence it is less irritated and it will grow more slowly. In the opinion of the author it is clear that there are no means of infallibly diagnosing cancer of the stomach in its early stages; but he does believe that by carefully considering a number of points we might sometimes arrive at a diagnosis earlier than we do, and therefore give the patient the chance of excision, for medicines are powerless to cure him. Speaking generally, it is only in the early stages that excision can do any good, for secondary deposits usually form rapidly, and before subjecting the patient to an operation the whole body must be thoroughly examined to ascertain if any can be detected, and special attention must be paid to the liver and the left supraclavicular glands. Further, each individual case must most carefully be considered, for there is no doubt that many persons have had their lives shortened by excision of a gastric carcinoma; perhaps this, however, would not so often have been the case had the diagnosis been reached earlier. Lastly, even if it is decided that excision is impossible, consideration should be given to gastroenterostomy, for the relief which follows this when the pylorus is obstructed may be very great.

VENESECTION.

In the *Clinical Journal* of March 31, 1909, HALE WHITE discusses the subject of venesection and asks the question, What are the reasons for which we should bleed? There is no doubt whatever, the author thinks, that the great majority of patients for whom bleeding is desirable are people in whom the right side of the heart is overgorged with blood. That is most often a result of disease of the mitral valve, or a result of bronchitis or pneumonia. We recognize the condition by noticing that the patient cannot breathe properly, he is very livid, the tips of the ears and nose and the lips are livid, the finger-nails are blue, and

the breathing is very hurried and distressful. The pulse is small, and sometimes by percussion we can make out that the right side of the heart is dilated. And no doubt if such a patient were well enough to be *x*-rayed we would be able to see that the right side of the heart was distended. To show the good which can be done for a case like that, the author gives a quotation from Sir Samuel Wilks; it is quite graphic. This authority says: "You see your patient sitting up in bed, the face, tongue, and lips blue or purple, and the jugular veins starting out of the neck and often visibly pulsating; the heart beating quickly and perhaps a tricuspid bruit, indicating the gorged right heart and obstructed lungs; the veins in the body are full to bursting." According to Hale White that is the most satisfactory kind of case to bleed. It has been said theoretically that bleeding would not do any good for such a case owing to the valves in the veins, but the writer states that he knows that it does do good, and the distressing condition immediately passes off. Possibly the veins are so stretched in such a case that the valves do not act. At any rate there is no doubt that if we bleed a patient who conforms to the picture drawn by Sir Samuel Wilks we will see the lividity pass off, the pulse will become better, and the breathing quieter and less labored. Further, as after bleeding in such a case the blood can flow better through the lungs, oxygenation of it takes place with greater facility.

The next question is, How much should the patient be bled? There is no rule for that. But the average amount is ten to fifteen ounces. Another point is, it has been pointed out that a small pulse in such a case as that we have just considered is a reason why we should not bleed. It is stated by the thoughtless that the smallness of the pulse is an indication that bleeding would be fatal. But the fact is that a small pulse is the very reason we should bleed, the interpretation being that so much blood is dammed back in the venous system that not much of it gets on to the arterial system and the pulse is consequently small. It will often be noticed after bleeding in the kind of patients we are describing that the pulse will improve considerably. Another thing will be noticed—sometimes in a cardiac case if the patient does not respond to digitalis when he is in this livid condition he will respond to it after the bleeding. That is not surprising, because in the first place the circulation is very poor before the bleeding, and in the next place the heart muscle, like any other muscle, is full of venous blood, and digitalis does not get a chance until the patient has been bled, and it certainly cannot act on the right ventricle until the patient has been bled, because the right ventricle is in a state of paralytic distention, and therefore cannot contract in response to the digitalis.

PITUITARY GLAND.

In the course of a research, published in the *British Medical Journal* of March 27, 1909, BELL and HICK state that in their opinion extract of the pituitary body may be given in the dose of two cubic centimeters for the purpose of raising blood-pressure in shock and also for the purpose of causing contraction of the uterus. They also believe that this same extract may be used in place of eserine in paralytic distention of the bowel.

TUBERCULOSIS.

LAIDLAW writing in the *Medical Record* of April 10, 1909, reminds us that in the year 1882 was ushered in the bacteriological era with Robert Koch's masterly work in the discovery of the tubercle bacillus. For a time the profession was bacillus-mad. Timid diagnosticians were afraid, and are still afraid, to make a diagnosis of pulmonary tuberculosis unless the bacillus was found in the sputum. Recently there has been a welcome reversion to well-tried physical signs, and the physician who now waits for the appearance of the bacilli in the sputum before making a diagnosis of pulmonary tuberculosis is rightly regarded as having waited too long.

Marked as was the effect of Koch's discovery on diagnosis, it was destined to work a still greater revolution in therapeutics; and for the first time the question was squarely presented, Shall the medical treatment of tuberculosis be mechanist or vitalist? Shall we kill the bacillus or stimulate the vitality of the patient?

For a time it looked as if the mechanist method would triumph, at least in popularity. To the mechanist, killing the bacillus seemed equivalent to curing the disease, and many weird and wonderful methods were devised for this purpose. We had Burgeon's insufflation into the rectum of sulphuretted hydrogen and carbon dioxide, which were exhaled by the lungs and supposed to suffocate the bacilli in transit. Creosote had long been used as an antiphthisicum. It was now believed to kill the bacilli when exhaled in the breath. In the *Journal of the American Medical Association* for 1887, page 143, will be found the formula for a marvelous antiseptic pulmonary lozenge that dissolves in the stomach, is exhaled in the breath, and kills the bacilli en route. Time lacks to review the antibacillary mania in all its vagaries. Suffice it to say that we are past all that. In this antibacillary treatment the headlong, enthusiastic mechanist did not see what was plain as day to the vitalist, that even if we should succeed in killing the bacilli the patient was just as vulnerable as before; that the patient had certain natural protective powers, and if these were stimulated he would get well and kill the bacilli himself.

In looking back on the antibacillary days, the author perceives one great good which may not have been achieved by any less spectacular method. It impressed the medical mind strongly with the curability of consumption, and however foolish the methods, they have passed away and left as a legacy a firm faith in the curability of consumption which is probably worth all the temporary error.

It is fair to state also that Koch and the practical bacteriologists kept aloof from antiseptic pulmonary therapeutics. It was chiefly the work of clinicians untrained in bacteriology, but it was none the less widespread, because so plausible. Koch and the bacteriologists were working along a different line, and with Koch's discovery of the curative power of the extract of the tubercle bacillus, tuberculin, the era of vitalism in bacterial therapeutics fairly opened. Into the history and uses of the various tuberculins the writer has not time to enter. It is enough to say that, in using them, we are treating a bacillus disease with a substance that is not a germicide, that will never kill the bacillus, but which stimulates the tissues of the body to protect themselves.

THE POSSIBILITY OF PREVENTING DIABETES OR OF POSTPONING ITS ONSET.

WILLIAMSON writing in the *Practitioner* for April, 1909, states that precautions for preventing or postponing the onset of diabetes may be considered in the following cases:

1. In the case of individuals who have a family history of the disease, and especially if a brother or sister has suffered.

2. In the case of Jews, whose profession or business causes great mental overstrain, especially those who are very ambitious, those who are very stout, who eat an excess of food, and who take little exercise.

3. In the case of women whose urine has contained a considerable amount of grape sugar during pregnancy, which has disappeared after parturition.

4. In cases of gout, acromegaly, and great obesity, especially if the obesity should have developed at an early period of life.

5. The possibility of diabetes is worthy of a thought in the case of men who have reached the age of forty or fifty, who have had great mental strain in their profession or business, who have been very ambitious, worked very hard, and taken little exercise. If such individuals have taken an excess of food and alcohol, and have become stout, there is a greater risk.

6. In very stout women just after the climacteric period, and after an operation

on the uterus or ovaries, the risk of diabetes is worth bearing in mind, especially when there is a family history of the disease.

7. When the urine has been found to contain a trace of sugar temporarily after an acute illness, an injury, an excess of sweet food, etc., or at the examination for life insurance, the question of the prevention of permanent glycosuria, or true diabetes, requires consideration.

8. In all cases of permanent slight glycosuria it is desirable that the mode of life, diet, etc., should be carefully considered and regulated, with the object of preventing, if possible, the affection from developing into a severe form of diabetes. Many cases of slight or temporary glycosuria develop, in course of time, into severe diabetes; but it is important to remember that this is not always the case, and, both in the young and the old, a slight glycosuria may disappear or remain slight or intermittent, without progressing into severe diabetes.

When a consideration of the family history or life history of any individual leads us to think that there is a special risk of diabetes developing, the following precautions as to the mode of life appear to be advisable, in view of what is known regarding the etiology of the disease:

Sugar, sweets, chocolate, very sweet fruit, and all articles of diet or drinks containing much sugar should be avoided. It is easy for most individuals to acquire the habit of taking food without sugar; but if there should be difficulty in this respect, saxin or saccharin may be used.

Unless actual glycosuria has been detected there is no reason why an average amount of starchy food should not be taken; but of course great excess of starchy food would not be desirable. As already mentioned, observations on alimentary glycosuria show that sugar is much more powerful than starch in producing glycosuria.

The total amount of food should not be excessive, especially after the age of forty. Strict moderation as regards all forms of alcoholic beverage is important, and sweet wines (especially port, Tokay, and champagne) and liquors should not be taken. Beer should only be taken in very moderate quantities. All beverages containing much sugar should be avoided.

A sufficient amount of outdoor exercise is very desirable, and this is particularly important if the occupation should be a sedentary one. Dyspepsia and constipation should be treated, since severe dyspepsia is occasionally an antecedent of diabetes. As mental worry, mental overstrain, and overwork are so often exciting causes of the disease, it is advisable that those who are considered to be predisposed to diabetes should, if possible, choose an occupation in which there is not a special risk of these injurious influences, or that the work should be so arranged, or modified, as to diminish this risk to the minimum.

The possibility of diabetes developing is worthy of a thought in the case of successful barristers, solicitors, and medical men, who are working at high pressure, and have little time for exercise or holidays, and also in the case of publicans, who are taking alcoholic beverages in liberal quantities.

The physical and mental overstrain connected with the nursing of a sick relative or friend through a long illness should be avoided by those who are thought to have any predisposition to diabetes.

In the case of married couples, if one should suffer from diabetes, it is probable that the liability to diabetes in the other is very slightly increased, whatever may be the explanation.

In cases in which a temporary or slight glycosuria has been detected, in addition to the precautions already mentioned, the starchy articles of food should also be restricted, because it is most important to prevent, or postpone, the development of true severe diabetes in such cases; and it is important to remember that, if the development of true diabetes can be postponed until the individual is past middle life, the disease will probably be of a less severe form.

When a considerable amount of grape sugar has been present in the urine during pregnancy, and especially if there have been thirst and diuresis, it is most desirable that pregnancy should not occur in the future.

ULCERATIVE COLITIS AND ITS TREATMENT.

HAWKINS writing in the *British Medical Journal* of May 27, 1909, states that until specific treatment can be provided he does not think any dogmatic rules of procedure can be given. Looking back on the cases for which he has been responsible, he feels sure that lives might have been saved by an earlier recourse to colostomy. As regards serum treatment, there is no doubt that immune serum has a specific agglutinating action on each member of the dysenteric group. Vaillard and Dopter, however, find that serum immunized with the Shiga-Kruse bacillus has a favorable influence on cases, whether they are due to Shiga's bacillus or to Flexner's bacillus. Shiga has made a serum covering three types. The Shiga-Kruse bacillus alone is used by the Lister Institute for the manufacture of their serum. In France, Coyne and Auche have made a Shiga-Flexner serum, which is effective in infantile colitis.

The author has used the serum of the Lister Institute freely in five cases, but he can offer no opinion as to its utility, for all the cases were chronic and various other methods of treatment were in force at the same time. The coli serum used in one case seemed to be beneficial. As regards coli vaccine, which was used in many cases, no obvious benefit can be noted. Another case had three doses of a vaccine of Shiga's own bacillus and of B. coli without benefit.

From the point of view of treatment, two classes may be considered.

(1) *Dysenteric Diarrhea.*—A short, mild attack may yield to opium and bismuth, but in using these and such-like drugs we are only treating a symptom, and are relying on a natural resistance to the infection, which may or may not be forthcoming. It is clear that ipecacuanha has no specific influence on the disease. As regards Japanese dysentery, Shiga says of ipecacuanha that "it has a very poor place as a dysenteric remedy." In asylum dysentery, also, it appears to be useless. The general custom now is to use calomel, and the author believe this to be the best line of treatment. Shiga gives 8 to 12 grains once or twice, or one dose of castor oil 3 to 5 drachms, or one dose of calomel followed by castor oil. In asylum dysentery also Gemmell found calomel beneficial. The writer prefers to give it in frequent small doses rather than a few heroic doses, and combines it with opium. Calomel, 1 or 2 grains, with opium, ¼ grain, can be given three or four times a day.

With the calomel treatment Shiga recommends simple enemata of one-per-cent saline or soda solution for cleansing purposes (no astringent being permitted), with suppositories of opium, cocaine, or belladonna, and if there is much hemorrhage he applies an ice-bag to the abdomen and gives opium by the mouth.

Whatever temporary views we hold as to the nature of ulcerative colitis, the author believes it is wise to use the serum of the Lister Institute in all acute cases. By its use Shiga states that "the course of the Japanese disease is shortened in those who recover, and lengthened in those who otherwise would die," and his figures show under its use a diminution of the mortality by about one-half (from 22 to 26 per cent to 9 to 12 per cent). The serum is bactericidal and antitoxic. The author has given as much as 80 Cc. in a chronic case in which recovery ensued, but it was combined with much other treatment.

(2) *Acute and Chronic Necrotic Disease.*—In the case which is severe from the first, and in which fever and toxemia are considerable and wide-spread inflammation and necrosis of the mucosa are manifested by abundance of polymorphonuclear leucocytes and blood in the stools, the same line of treatment may be adopted. But if improvement is not quickly seen, we are face to face with a condition which may either prove fatal in the next few weeks or may tail off into the chronic and nearly incurable form. The question of local treatment, in addition to the use of serum, becomes imperative. It is easy to be too optimistic and to wait too long for cure. In genuine ulcerative colitis, as distinguished from the great functional and subinflammatory conditions

of the colon with which it is often confounded and in which cures under any treatment are common enough, a deceptive appearance of health may be preserved for a time, while the disease extends upward.

Even a pure lower segment infection may quickly get out of control. We have to decide between irrigation per rectum, appendicostomy and irrigation, and colostomy with irrigation and the establishment of a free artificial anus. The right plan can only be settled by the degree of severity of the toxemia and the probabilities as regards the extent of the disease in each individual case. From what the writer has seen, he has no high opinion of irrigation per rectum. He thinks irrigation by appendicostomy has advantages over rectal irrigation, but in no other respect has appendicostomy anything to recommend it. But looking back on many of these cases and on the condition of the colon after death, he believes that colostomy will prove to be the most life-saving proceeding in the long run. It affords complete rest to the colon as well as efficient irrigation.

The irrigating fluids that may be used are innumerable. Silver nitrate, creolin, boric acid, argyrol, and tannin are often used. Among other things the author has tried methylene blue (2 to 3 grains in a pint). In one stationary case under his care, milk, in which lactic acid bacillus had been incubated for twelve hours, was injected daily through an appendicostomy for a long time without obvious result. Similar milk he has given freely by the mouth and in large quantities by rectal irrigation without any apparent benefit. In his most successful case he used an emulsion of sulphur, 120 grains in 4 ounces of oil. This was thrown into the colon through an artificial anus every other day, and on the alternate days thorough sluicing with boric-acid solution was carried out. This was employed for seven weeks. With the same idea of using something that will adhere to the mucosa, Shiga has employed enemata of gum arabic mixed with bismuth, gallate of bismuth, or iodoform.

PARALYSIS AGITANS.

In the London *Lancet* of March 27, 1909, TAYLOR states the well-known fact that paralysis agitans is one of the most distressing diseases of degenerative type with which we have to deal. The most troublesome symptom is the shaking, but besides this the patient frequently complains of the feeling of constant heat, of free and troublesome perspirations, and not infrequently of sleeplessness. It is idle to hope that we shall ever be able to cure such a disease. But it would be something to be able to relieve some of the troublesome symptoms, and the writer has been greatly impressed with the efficacy of hyoscine in modifying—one might almost say, in some cases, in controlling—the tremors. He usually gives the hydrobromide, and he gives it with a small dose of strychnine in an acid mixture. The dose he usually begins with is 1/200 of a grain three times a day, and this can sometimes be increased up to even 1/100, but sometimes is efficacious even if only given at 1/200 twice daily. The drawback to its use in this and in other diseases with tremor is the excessive dryness of the throat which it produces, and it also in some people very readily apparently produces paralysis of accommodation and pupil dilatation, so that these two inconveniences have to be borne in mind, as it is often necessary to reassure the patient who complains of them. Of course, one meets with certain cases—perhaps it is that in these the disease has reached a certain stage—in which no benefit is experienced from the drug. Yet in many cases, as above stated, it is useful in controlling, or at least in modifying, the severity of the tremor.

THE HEART IN PULMONARY TUBERCULOSIS.

In concluding an article on this topic in the *American Journal of the Medical Sciences* for February, 1909, BROWN states that the treatment of the various forms of valvular heart disease, occurring in connection with pulmonary tuberculosis, differs in

no way from that ordinarily employed in cardiac disease. Moderate elevations, not over 2000 feet, are said by Anders to be the best for patients with valvular disease, but if well compensated they often do well at greater elevations. Patients should be fully warned against overexertion, for they have even less reserve force than the ordinary patients with only cardiac disease, and slight efforts may produce signs of non-compensation in both systems, rendering them much more susceptible to secondary infection.

The treatment of the rapid heart action and cardiac weakness in pulmonary tuberculosis differs but slightly from that ordinarily employed. Digitalis and strophanthus are of little avail. Arsenic, strychnine (in large doses), an ice-bag over the precordium, carbonic acid baths, rubs, absolute rest at first, and carefully regulated exercises relegated chiefly to those muscles which throw little or no stress upon the muscles of the thorax, are all of value. Nitroglycerin may give marked relief. Excitement of any sort should be avoided, and it is wise to refrain from alcohol and tobacco and to use coffee in moderation, if at all. Burton-Fanning has pointed out the value of restriction of food, and in some cases it is wise to omit milk for a time. Flatulency must be rigorously combated, and the diet should be rich in easily digested proteids. Palpitation of the heart should be treated by rest and the ice-bag, but bromides and valerian may be required.

MEAT BROTHS FOR INFANTS.

W. STOELTZNER (*Medizin. Klinik.*, Feb. 7, 1909) has obtained excellent results, in the case of infants brought to him with gastrointestinal symptoms due to a diet of flour foods and sugar, by putting them on a mixture of milk and meat broth. Bretonneau in 1818 first attempted to feed young infants suffering from atrophic chronic gastrointestinal symptoms on milk mixed with broth instead of with water; since that time the system of infant feeding has never fallen into absolute disuse in France, some doctors recommending it, as did Bretonneau, only for atrophic infants, others for any infants for whom breast feeding was not obtainable. In Austria, Mayer in 1850, Monti and v. Huttenbrenner later, have all advocated the dilution of milk by broth, Monti for children with rickets, and v. Huttenbrenner even for newborn children. In Germany A. Steffen recommends a mixture composed of 50 grammes of milk, 50 grammes of meat broth, 1 teaspoonful of cream, and 3.8 grammes of milk sugar as an infant food, failing human milk.

Although from time to time the use of meat broths as a diluent of milk for infants has been recommended, it has never become widely popular. Stoeltzner, in the present article, describes his own experience and finds that meat broth is indicated for cases of "tabes mesenterica," or atrophy, caused by a flour diet. He reports fourteen such cases, one of them dating back to 1905, the other thirteen belonging to the years 1907 and 1908. The broth used was made from beef or veal, and was of ordinary medium strength; sugar was never added to the mixture. The relative strength of milk and of broth in the mixture varied according to the case. The average age of the children was five months, with an average weight of 4055 grammes (9 pounds approximately). Seven of the children had never been breast-fed, the other seven had been breast-fed on an average for 2.7 months. The length of time of feeding on flour food was not less on an average than two and a half months. Eight children during the whole of this time had not been given any milk at all; six had received small amounts of milk along with the carbohydrates; to this group belonged one child fed on Nestle's food and three on condensed Swiss milk. Eight out of the fourteen children suffered at the beginning of treatment from diarrhea, which in some cases had persisted for weeks and months. Six children were in an especially serious condition; two of them showed pronounced myotonia; one obstinately refused food. One child at three months weighed only 2970 grammes (6½ pounds approx-

imately). Unfortunately, in nine cases the treatment was only carried out for a short time; but even these cases served to show that diarrhea, when present, quickly stopped when feeding with the mixture of milk and broth was begun. In six out of the nine cases a gratifying increase in weight became evident; of the remaining three, one child during the time of the diet suffered from an influenza-like feverish attack, a second did not take enough food, a third soon after the beginning of the treatment began to have dry, crumbling stools. The course in the five cases which remained longer under treatment was very favorable; immediately or soon after the beginning of treatment the weight in each case began to go up, and the further increase left nothing to be desired.

Although the whole number of cases is not large and they all belong to the hospital class, yet the results were so clear that the author finds himself justified in considering that the symptoms due to a flour-food diet form an indication for the milk and meat-broth diet. Further information is needed as to how long the diet should be persisted in. Two of the cases appeared to indicate that the milk and broth mixture was only of value for a few days, and that some children could after that return to milk and flour mixtures.—*British Medical Journal*, March 27, 1909.

THYROIDECTOMY FOR EXOPHTHALMIC GOITRE.

Ferguson *(Surgery, Gynecology and Obstetrics,* March, 1909), after a brief reference to tetany and myxedema and hyperthyroidism as complications of goitre, expresses his belief in Crile's method of stealing away the gland when operation is decided upon. The patient is put to sleep without her knowledge, inhalations of essential oils being given for several days before operation, the patient not knowing when the anesthetic is really given, and being led to believe that these inhalations in themselves are therapeutic measures. Ferguson advises giving 30 to 60 grains of chloretone within two hours before the operation. That makes the patient very drowsy and she does not know anything about the anesthesia. The principal effect of the drug is to quiet the patient and bring her promptly under the effect of ether.

The technique of the operation is thus described: A transverse incision is made, because it gives more room for working, and the gland can be removed with the least possible disturbance. It also gives better drainage, and the scar is behind the collar. The incision is carried through the skin, platysma, sternohyoid and sternothyroid muscles, and the sternal portions of the sternocleidomastoid muscles. The capsule of the thyroid is then opened. Care must be taken in picking up the capsule to select a point where the vessels are sparse. After the capsule has been opened, the finger is passed down alongside the gland until a free space is found, where there are hardly any vessels, midway between the superior and inferior thyroid vessels. In the center of the gland is a free space. That is the first landmark in the removal of the gland. Then a long, blunt, stout pedicle needle is passed through the gland from without inward, and downward, for the interior thyroid vessels, and then inward and upward, so as to surround the superior thyroid vessels, being careful to pass through the parenchyma of the gland, and not to go too close to the trachea. This is done inside of the capsule of the gland. The stout catgut ligature is drawn through with the pedicle needle and tied, thus leaving a button of thyroid tissue at each angle. Ferguson considers this an advantage over the old method of leaving a large mass of tissue in one place. There is only a little handling of the gland, which is very desirable. If it is difficult to bring the gland forward, do not seize hold of it with the hand, but take a good solid bite in the center of the gland with toothed cyst forceps. This allows of swinging the gland in any direction.

Having tied the ligatures, the circulation to the gland is cut off and the absorption

of the liquid gland secretion is prevented. The remainder of the gland is then cut off freely. A certain amount of hemorrhage will take place at various points, but is easily controlled by means of forceps, ligatures, or sutures. Crile is in the habit of touching the stumps of the gland with Harrington's solution.

In closing the wound he puts in all the necessary sutures, but ties only two or three or four at the most, for two or three days, which insures perfect drainage. The drain he uses consists of a strip of gauze wrapped round with a piece of rubber tissue. The patient is given 500 Cc. or more of normal saline solution on the table while still asleep.

The procedure outlined above allows of a speedy operation, safeguards the parathyroids in the best possible manner, with a minimum amount of hemorrhage or shock, and with fewer sequelæ and complications than are encountered by most surgeons. Injury of the recurrent laryngeal nerve is avoided by this method of tying the vessels. One should never look for either the laryngeal nerve or the parathyroid bodies.

Shock and sepsis are controlled in the usual manner. Ferguson believes that the occurrence of postoperative hyperthyroidism is prevented by early ligation of the vessels. Leaving a portion of the gland prevents myxedema, and tetany will not occur when the parathyroids are not removed nor their blood-supply shut off.

THE NEWER SILVER SALTS AS COMPARED WITH SILVER NITRATE IN THE TREATMENT OF OPHTHALMIA NEONATORUM.

CHENEY *(Boston Medical and Surgical Journal,* March 4, 1909) after a laboratory investigation as to the comparative bactericidal effect of solutions of silver nitrate, protargol, and argyrol, in which the greater power of the silver nitrate is strikingly shown, notes that a man who has had little experience with diseases of the eyes hesitates to drop into the apparently healthy eye of a new-born babe a solution that he knows to be an irritant and which may cause a catarrhal inflammation of the conjunctiva of a greater or less intensity. It is doubtful if a serious result ever follows the instillation of a drop of one-per-cent or two-per-cent solution of silver nitrate, nevertheless, in advising the universal use of this remedy it must be remembered that many to whom this advice is given are not skilled, so far as the manipulation of the eyes of young babies is concerned, and that occasional accidents may happen by a too free use of the drug or of a solution that is too strong. It is not to be wondered at that the medical man refuses to submit every new-born babe to this treatment in an effort to prevent a disease which occurs in his private practice certainly not oftener than once in five hundred confinements. Whether the newer silver salts will be accepted and generally used as prophylactics in private practice remains to be seen. Protargol even in 10-per-cent solution is but moderately irritating, and argyrol in a 25-per-cent solution rarely causes more irritation or feeling of discomfort than a three-per-cent solution of boric acid.

A point worthy of consideration and remarked upon by Mr. Stephenson is that the results are considerably better where nitrate of silver weaker than a two-per-cent solution was used than in the series where the solution was two per cent. As a reasonable explanation of this point he suggests the following: If silver nitrate causes a catarrhal inflammation, the conditions are much more favorable for the development of ophthalmia neonatorum, if any gonococci remain undestroyed, than they would be if a catarrhal inflammation were not present. If silver nitrate is to be used, therefore, a weaker, less irritating solution than a two-per-cent is to be preferred. It is also to be noted that the percentage of the ophthalmia neonatorum is much smaller in the series of cases treated with protargol than with argyrol. Accurate comparisons cannot be formed as to the comparative value of the two remedies from these statistics, how-

ever, for the reason that while protargol was generally used in a 10-per-cent or 20-per cent solution, the strength of argyrol is not given in the larger proportion of cases, and in 1334 (the only cases in which the strength is given) was but four per cent.

It will be generally admitted that ophthalmia neonatorum should when possible be treated by the oculist and not by the general practitioner. A large number of these cases are, however, first seen by the family physician, and he is obliged to take the responsibility of their treatment, temporarily at least, whether he wishes to or not. The question is, is it advisable that he should use nitrate of silver when such an emergency arises? In applying nitrate of silver it is necessary to evert the upper lids, and this is not easy of accomplishment in a new-born babe. A man not experienced in this manipulation stands a fair chance of abrading the cornea, and infection and ulceration will be the probable result. There is also the danger of corneal injury from a too free use of this remedy. These two possibilities should contraindicate the use of nitrate of silver in ophthalmia neonatorum except by men of experience in the treatment of diseases of the eye. It requires no special experience, however, to use a 10-per-cent solution of protargol or a 25-per-cent solution of argyrol. It is not necessary to evert the lids, for these remedies can be dropped into the eye like any ordinary collyria, and they can be used freely, and as often as once in four hours.

THE OPERATIVE TREATMENT OF AN IRREDUCIBLE FRACTURE OF THE SURGICAL NECK OF THE HUMERUS.

JACOBSON (*Surgery, Gynecology and Obstetrics,* April, 1909) summarizes an article on this subject as follows:

In fractures high upon the humerus, the great leverage exercised by the lower fragment on the lesion tends toward displacement of it after reduction.

Reduction, with non-operative treatment, should always be attempted in fracture high up in the humerus, but should always be controlled by *x*-ray examinations, and when found to be irreducible, operative interference is demanded.

Steel plates and screws are our best means of internal splintage in fractures of the surgical neck of the humerus.

The most rigid aseptic technique must be employed.

The metal plates and screws, when properly employed, as a rule give no trouble, and are easily removed if they do.

Prolonged fixation of the arm is unnecessary with this method, and passive motion can be used earlier than in any other form of treatment.

KOCH'S TUBERCULIN IN THE TREATMENT OF TUBERCULOSIS OF THE BONES AND JOINTS.

STERN (*Cleveland Medical Journal,* March, 1909) thus concludes his article on this subject:

Koch's tuberculin, although a terrible agent for harm when used indiscriminately in large doses, is a powerful agent for good when used in small doses either by the opsonic method of Wright or the clinical method of Trudeau.

The laboratory method of Wright is still too complex, intricate, and costly to be able to diagnose, treat for from nine to eighteen months, and bring to a cure the general run of tuberculous cases which one sees in orthopedic practice. While not decrying its absolute value, the greatest good to the greatest number is obtained by following the clinical method of Trudeau in treating bone and joint tuberculosis.

Notwithstanding the statements of the laboratory men to the contrary, no harm can come and a great deal of good can follow the proper use of tuberculin without the control of the opsonic index.

No matter which method is followed, tuberculin must not be used alone for treatment, but must invariably be a part of a rigid medical and surgical antituberculous régime.

When so used it has proved an invaluable aid in the treatment. The author's

cases have done better with it than they would have done without its use. They have responded quicker and have been discharged in less average time than ever before. Complications have either been avoided or when present have invariably (with one exception) subsided on its continued exhibition. This has been especially noticeable in adult or older cases, in some of whom the gain in weight and strength has been truly remarkable.

Tuberculin is not a cure-all, but so convinced is the author of its efficacy and value that he will continue to employ it in the future in all cases of tuberculous bone and joint disease unless its use should be specially contraindicated.

THE PROGNOSIS AFTER OPERATIVE TREATMENT OF SPINA BIFIDA.

BOETTCHER (*Beiträge zur Klinischen Chirurgie,* Band 53, 1908) reports 64 cases, which occurred in Breslau from 1891 to 1906, or were seen by Garré in Rostock or Königsberg. The cases are classified as follows:

1. Total or partial rachischisis.

2. Cases in which the cord has closed but a vertebral defect exists through which a hernial protrusion occurs, in which the contents of the spinal canal participate in some degree.

(*a*) Meningocele.
(*b*) Myelocystocele.
(*c*) Myelocystomeningocele.
(*d*) Spina bifida occulta.

Facts which bear upon prognosis:

1. Age. Four operative cases were more than one year old. These all lived. Of eight which were two to fourteen days old all died. Patients two to seven weeks old showed a mortality of 22 per cent. The remaining cases, aged two to eight months, showed a mortality of 33 per cent.

2. Sex. Of 64 cases 40 were females, or 62.5 per cent; of these 25 were operated, and 12, or 48 per cent, died. Twenty-four cases, or 37.5 per cent, were males; of these 14 were operated and 29 per cent died.

3. General condition, the weaker ones naturally succumbing easily.

4. Location. Those occurring in the sacral region or lowest lumbar segment where no cord exists are safer, since one has to do with a simple meningocele. On the other hand, the closer to the anus the greater the danger of infection.

5. Perforation of the sac means death from meningitis.

Radical operation is recommended, with opening of the sac. A plastic closure of the vertebral defect must be made if possible. Cord anomalies must be dealt with so as to produce relationships as nearly normal as possible. Postoperative meningitis occurred in 6 of 39 operative cases. Two of these were cases of spina bifida ulcerata.

The sudden decrease of intraspinal and intracranial pressure from sudden release of fluid at operation is to be feared. No sudden death at operation occurred in this series, but in a few cases death after operation was ascribed to this cause. Postoperative hydrocephalus occurred six times. Boettcher believes this to have an infective basis, and to be in reality a meningitis serosa diffusa.

Taking all forms of cases together operation results were: Of 64 cases 39 (61 per cent) were operated. Cases with severe motor or sensory disturbances of the lower extremities or of the bladder or rectum were not operated. Infected and perforated cases were also excluded. Of 39 cases 25, or 70 per cent, died. Immediately consequent on the operation 13, or 52 per cent, died. In 6 of these meningitis was the cause, in 4 postoperative hydrocephalus, and in 3 it was unknown. Ten of the remaining deaths occurred later, of other diseases. In 12 of 39 cases, or 33 per cent, a complete cure is recorded, without paralysis or sensory disturbance. These were cases of meningocele only. It does not seem possible to improve motor or sensory defects through attempts at correction of cord anomalies.

Prognosis of particular types:

1. Meningocele. Of 13 cases 12 were operated. Of these 9, or 75 per cent, lived.

2. Myelocystocele and myelocystomeningocele. Of 17 cases 11 were operated. Four of these showed no paralytic condition at time of operation, and in one a perfect result ensued. Two cases died at once. In four cases paralyses came on after operation.

3. Total and partial rachischisis. Total cases cannot live. Of 8 partial cases, 6 showed ulcerations or paralysis of lower extremities, bladder, or rectum, and were not operated. They all died. The other two were operated. One case showed paralysis of the lower extremities after operation and died of meningitis. The other gradually acquired paralysis of the legs, decubitus, and died ten months later.

4. Spina bifida occulta. Only one case was operated. Result was successful.—*Surgery, Gynecology and Obstetrics,* April, 1909.

SEQUELAE OF ADENOIDS.

HERZIG (*New York Medical Journal,* Feb. 6, 1909) notes that the positive diagnosis of adenoids can be made by digital examination and by no other method. Some authors assume to make a diagnosis by examining the posterior pharyngeal wall for small granular hypertrophies. The latter are not convincing to the author, as many children have adenoids without the appearance of these small posterior hypertrophies; also children having a recent removal of adenoids are sent to a different doctor because of continuance of the symptoms of adenoid hypertrophies. In examining these children we find these granular hypertrophies upon the posterior pharyngeal wall; but no adenoids, the patient having a postnasal catarrh and all the symptoms of an ill-trained mouth-breather. In adults these hypertrophies may occur upon the posterior wall when nothing else is present, and are due mostly to the constant irritation of the throat, as in singers, public speakers, and smokers.

A word as to the examination of these children. It is impossible to make a posterior rhinoscopic examination with a mirror in very young children, hence a digital examination is necessary. It is performed as follows:

The child or infant is placed upon the mother's or nurse's lap, with the head resting between the doctor's knees, or the child sitting upright in a small chair, having the hands held; the index-finger of the right hand is placed in the child's mouth and carried upward laterally until the roof of the nasopharynx is reached, the left hand in the meantime pushing the child's cheek between its teeth, so as to prevent the examining finger being bitten.

In the first instance the examination is done with the child lying down. In the second case the doctor stands behind the child. In adults the diagnosis is made by means of the postrhinoscopic mirror. The examining surgeon should first feel for the central adenoid mass and locate it, then examine the lateral walls to see how much of the hypertrophy is present above or around the Eustachian tubes. This must be carefully noted before operating, as it is most vital to the child's hearing. Note is also taken of the dimensions of the postnasal space as to height and breadth.

The diagnosis is also aided by the facial expression.

Symptoms may be present in part or in total, no one case resembling the other exactly. The most common symptom is that of nasal obstruction, evidenced by mouth-breathing. Postnasal catarrh is present, due to the increased secretion of the hypertrophic tissue. A high, V-shaped arched palate is common, due to malformation of the cranial bones during the period of development, caused by improper respiration. The child is pallid, has a dry, hacking cough, wets his bed, snores habitually, and is subject to night terrors.

When nosebleed occurs it is due to the extreme friability of the adenoid tissue and may be induced by sneezing or coughing.

In nursing infants the nasal obstruction due to adenoids causes improper feeding, and many infants lose flesh and strength owing to their inability to nurse. A complete removal of the adenoid vegetations

gives the baby an opportunity to draw air through its nostrils, which is essential in the action of sucking. These children quickly gain in weight soon after these growths are removed.

Deafness in early life finds its most frequent cause in adenoids.

Laryngismus stridulus, also called false croup, is mainly ascribable to adenoids and consequently mouth-breathing, which in its turn causes a dry and irritable larynx. Choreiform movements of the soft palate were observed by the author in one of his cases, which disappeared promptly upon the removal of adenoid vegetations. Enlarged tonsils are also helped in their growth by the presence of adenoids, and *vice versa*. In cases of pertussis, in which the cough remains unusually long, look for adenoids. If these are found a complete removal of the latter will shorten the attack.

Children suffering from adenoids have dull, apathetic, heavy, and stupid features, pinched noses and indrawn alæ, depressed inner canthi, elevated eyebrows, and wrinkled foreheads. After removal of adenoids the change in features is most pronounced for six to ten months after the operation, when they return to normal. In extreme cases anesthesia of the soft palate and uvula is seen, also constantly recurring cases of bronchitis and laryngitis. Finally pulmonary tuberculosis.

The most common sequel of adenoids is ear affection, such as acute purulent otitis media and all its complications, as mastoiditis, sinus thrombosis, and brain abscess. The adenoids act by diminishing the blood-supply of the middle ear and so placing it in a good position for the development of colonies of microörganisms.

In 142 cases of ear troubles, associated with adenoids, retraction of one drum membrane showed in eight cases; retraction of both drum membranes in fifty-two cases; retraction and congestion of both drum membranes in eighteen cases; retraction of one drum membrane and acute purulent otitis media in the other ear in thirty-six cases; double acute purulent otitis media in twenty cases; cicatricial adhesions in eight cases.

Hearing was good in fifteen cases, not easily determined in thirty cases, and distinctly impaired in ninety-seven cases. Out of over 10,000 throats the author examined, he has found that enlarged tonsils are associated with adenoids in about one-third of the cases.

Adenoid vegetations, when small in amount, and not causing any of the indications which the author enumerated, should be left alone, and may be treated by hygienic measures and local astringents. The author has found hydrargyri chloridum mite, 1/10 grain tablet, taken three times daily after eating and continued for thirty days, stopping a week and then continuing again for a month, and so on until a year or a year and a half is passed, of the greatest benefit in reducing the size of these vegetations.

As regards the astringents used, the author prefers a ten-per-cent solution of silver nitrate, applied directly to the postnasal growth, this to be done three times a week for eight to twelve weeks. The indications for the complete removal of adenoid vegetations are as follows: (1) Nasal obstruction, causing mouth-breathing and its sequelæ; (2) recurring attacks of earache; (3) stupidity and inability of the children to concentrate attention; (4) stunted growth, and in all cases of purulent otitis media in children; (5) in infants whose inability to nurse is due to adenoids, otherwise the author never operates upon infants under one year of age, and believes it a crime to do so.

The author prefers the use of chloroform anesthesia in operating upon nearly all his patients. The patient is prepared for operation in the following manner: The night previous a good dose of Epsom salts is given, a light supper consisting of two soft-boiled eggs, milk, or tea or coffee, bread or biscuits. The following morning at half-past nine the patient is given a glass of milk and two or three crackers with butter. The patient being anesthetized, the mouth

is gagged open, the tongue is depressed, and the adenoid tissue is removed by a cutting forceps, followed by an adenoid curette. Thereafter some sterilized gauze is wound around the index-finger and introduced into the postnasal space and vigorously rubbed over the raw surface, thus bringing away small excrescences of tissue which would otherwise have to slough off. The patient is then quickly turned to one side and the gag and tongue depressor removed. Profuse hemorrhage occurs, but ceases within two or three minutes after the operation.

No spray is applied to the throat or nose, except when the patients vomit during operation; then a 1-in-5000 solution of bichloride of mercury is employed. The patients are permitted to get up the next morning. Nothing is given postoperatively for four hours at least.

SPLENECTOMY.

FISHER (*Proceedings of the Royal Society of Medicine,* March, 1909) reports the case of a woman 47 years old, who entered the hospital complaining of a severe pain in the left hypochondrium, which came on suddenly four days before she was seen. This for two days was not entirely crippling in intensity, but thereafter had confined her to bed. Pulse, temperature, and respiration were about normal, and the abdominal wall was lax. There was felt, however, a large tumor on the left side, extending from beneath the costal margin just below the umbilical plane, and from the flank beyond the erector spinæ to the middle line in front.

Tenderness was most marked at the anteroinferior margin of the tumor, which felt sharper than elsewhere and notched. The liver was enlarged. The patient had suffered from heart trouble and occasional swelling in the legs and feet. The latter was most marked toward the end of the working day.

The provisional diagnosis of torsion of the spleen was made associated with general visceroptosis. The abdominal incision was made in the left semilunaris and the spleen was removed. It showed two large wedge-shaped infarcts of the lower pole, which accounted for the sensation of notching felt at the examination. The spleen was extremely fixed by adhesions, which were ligated and divided. The woman was discharged from the hospital twenty-five days later, without obvious anemia. Bone-marrow and iron mixture were administered. Examination of the blood six months later showed no notable changes.

PROSTATIC ABSCESS.

ALEXANDER (*Annals of Surgery,* April, 1909) states that the object of his paper is to record a series of operations upon the pathology and operative treatment of abscess of the prostate caused by gonorrheal infection. He has taken for the basis of his report 68 cases occurring in the service of the Bellevue Hospital. Twenty-six of these were treated by perineal section and drainage, and 42 by prostatectomy. Nearly all the patients were young men. Twenty-one cases were associated with perineal or ischial abscesses. Alexander states that nearly if not all ischiorectal abscesses which come under the observation of the genito-urinary surgeon are of prostatic origin, and that the reason for so many ischiorectal abscesses relapsing after treatment by simple incision and drainage is because the prostatic origin of the infection is overlooked. In the majority of the cases reported the process was confined to the prostatic capsule. A number of the patients were admitted to the hospital with a diagnosis of acute epididymitis, the prostatic condition being overlooked.

More than 50 per cent of the cases were suffering from retention of urine, which was usually complete. This retention had usually been preceded by frequent and painful attempts to urinate. In the case of a single focus of suppuration or a large prostatic abscess where one or both lateral lobes had been practically destroyed by suppurative processes, median perineal section and drainage of the abscess into the urethra is the method of choice. In multiple abscesses of the prostate, which are by far the most

numerous, time can be saved and a more perfect cure can be made by the entire removal of the diseased lateral lobe or lobes by median perineal prostatectomy.

The position of the abscesses in the prostate and the relation which they have to the urethra is subject to great variation. The abscesses always occur in the lateral lobes, and especially in that part of the lateral lobes situated at the side of the urethra. It is not uncommon to find suppurating foci in both the lateral lobes, though one is usually more affected than the other. Early operation may do much to preserve at least one-half of the prostate. The abscess may be situated near the urethra, or in the center of the lobe, or near the capsule. An abscess of small size near the urethra may rupture spontaneously into this canal, and if the drainage is good the cavity of the abscess may heal. This happy termination is, however, more theoretical than real. Multiple suppurating foci scattered throughout the prostate occur as a rule, and therefore in many cases even though one abscess has ruptured spontaneously into the urethra an operation will be required.

Alexander states that as our knowledge of diseases of the prostate become more accurate it will become more and more apparent that these suppurative conditions of the prostate cannot be treated by such methods as are now employed, as, for example, by way of dilatation of the urethra or by massage.

INGUINAL HERNIA OF THE CECUM.

Inguinal hernia of the cecum may be congenital or acquired. CARNETT (*Annals of Surgery*, April, 1909) describes three varieties of congenital cecocele:

1. The mobility of the cecum and its proximity to the internal ring easily permit its entrance into a patulous vaginal process, either before or after birth, forming an inguinal hernia with a congenital sac.

2. The plica vascularis or gubernaculum testis may serve as a bond of union between the testis and the cecum. With the descent of the testis the cecum may be actively drawn into the vaginal process.

3. After an early descent of the cecum to the iliac fossa adhesions may form between the cecum or appendix and testis. The descent of the latter drags the cecum into the inguinal canal.

By either the second or third mechanism the cecum may be drawn down to form a congenital sliding hernia of the intrasaccular type.

Acquired inguinal hernia of the cecum may be classified as (1) simple, and (2) gliding or sliding. The latter, designated by the French *"hernie par glissement,"* may be subdivided into (*a*) the intrasaccular; (*b*) the extrasaccular or parasaccular; and (*c*) the sacless.

The simple acquired cecal hernia is analogous to acquired hernia of small intestine or omentum. The herniated cecum possesses an intact peritoneal coat and lies within the sac. Its formation presupposes an unduly long or freely mobile cecum.

(*a*) Gliding intrasaccular cecal hernia may occur in two forms. In both the hernial sac is derived from the peritoneum of the abdominal wall, the cecum possesses an intact peritoneal coat and lies within the sac. In the one variety the relations of the cecum are the same as in the simple acquired hernia, except that its escape from the ring is due to a ptosis of the colon and its attachments. In the second form the cecum is provided with a mesentery which appears to be inserted in the wall of the sac.

(*b*) In the extrasaccular or parasaccular hernia the cecum is not contained within the sac, but lies on the posteroexternal sac wall, and can be exposed at operation or autopsy without the necessity of opening the sac. On its posterior and external walls the cecum is entirely bare of its serous layer and lies in direct contact with the cellular tissues of the inguinal canal and scrotum. A complete sac can be found in every case in front and to the inner side or above the cecum. The size of the sac often is insignificant in comparison to the size of the hernia. The entire appendix may have

either an intrasaccular or an extrasaccular position, or part of the appendix, usually the base, may be intrasaccular and the remainder extrasaccular. Inside the sac the appendix retains its peritoneal layer, but outside the sac its serous coat is wanting.

(*c*) The cecum may escape from the internal ring minus its own serous covering, absolutely free from any structure even remotely resembling a sac, and without producing a rent in the parietal peritoneum.

The gliding cecal hernias are produced by a ptosis or downward gliding not only of the cecum but also of the colon, its attachments and vessels, and the posterior parietal peritoneum. They all descend to a proportionate extent, so that the base of the ascending mesocolon will be found lying in the lower iliac fossa, inguinal canal, or scrotum, constituting an obstacle to reduction. Baumgartner has shown that there may be in addition a downward displacement of the kidney on the same side, due to its peritoneal attachment, and of the aorta and inferior vena cava, due to their vascular connection with the ptosed gut. Bennett and Cunningham observed one case in which the ureter was dragged forward. Tuffier has frequently noted nephroptosis associated with hernia of the large intestine.

About one-sixth of the reported cases of all varieties of inguinal hernia of the cecum were found on the left side. The disproportion between the two sides is undoubtedly greater in actual practice. The presence of the cecum in a left inguinal hernia was ascribed to enteroptosis, transposed viscera, congenital left-sided position of the cecum, the presence of a primitive or a long definitive ascending mesocolon, elongation of cecum incident to old age, adhesions of cecum to small intestine or omentum, and peritoneal traction exerted by huge hernia of the small intestines. In one case of scoliosis and another of kyphosis the spinal deformity may have been an etiological factor.

Left sacless and extrasaccular cecal hernias are rareties and are secondary to transposed viscera or congenital malposition.

Congenital and acquired, both simple and gliding (intrasaccular, extrasaccular, and sacless), left inguinal hernias of the sigmoid and descending colon are not uncommon.

Femoral cecal hernia is generally found in the female sex.

Inguinal hernias of the cecum are found at all ages, but are more common at the extremes of life.

Aside from the congenital cases, hernia of the cecum almost invariably develops slowly. Austin reports a very exceptional case in sacless hernia which he operated upon for strangulation sixty-five hours after the hernia made its first appearance.

The symptoms of hernia of the cecum are not characteristic. More or less severe symptoms of intestinal obstruction are not infrequent. Strangulation is uncommon. Irreducibility was noted in a large percentage of the reported cases. In actual practice the percentage is undoubtedly smaller, as the reducible cases frequently escape observation. Acute or chronic inflammation or strangulation of the appendix is a frequent complication. Hydrocele is occasionally associated. Bennett had a remarkable case complicated by intussusception of the ileum through the ileocecal valve.

The existence of the cecum and appendix within a hernia usually cannot be determined prior to operation, but a few cases have been reported in children and in adults with thin overlying tissues in whom these structures were demonstrable by palpation. Morestin has suggested taking a skiagraph after the administration of bismuth as an aid in the diagnosis. Coley found that in some of the congenital cases the hernia could be reproduced after reduction by traction on the testis. Differentiation between intrasaccular, extrasaccular, and sacless hernia is not possible except at operation or autopsy.

Those congenital cases of cecal rupture in which the hernia can be made to reappear by traction on the testis should be operated upon early. The pressure of a truss is prone to produce trouble. Barring the possible presence of adhesions, the intrasaccular form of cecal hernia, whether

congenital or acquired, does not offer any special operative difficulties. Adhesions of the appendix frequently necessitate its amputation before the sac can be excised.

In congenital cases in which a prominent peritoneal fold is present on the posterior aspect of the hernia, great care should be exercised in separating it from the underlying spermatic vessels. Neglect of this precaution has resulted in sacrifice of the testis in several instances.

The possibility of the intestine being unprovided with any serous covering should be borne in mind constantly at every operation for hernia, otherwise the intestine may be opened inadvertently in a search for the sac. The surgeon usually recognizes the fact that he is dealing with an anomalous hernia shortly after splitting the external oblique muscle. In some cases the extrasaccular portion of the intestine is readily recognized by its bare muscular fibers, but in some instances the gut might be mistaken for a thickened sac. In case of doubt the hernia should be examined at once from its peritoneal side.

No single region is suitable for incision in every instance, and the surgeon must use discretion as to the best site for opening the sac in each individual case. If the sac cannot be absolutely identified the structures about the internal ring should be retracted sufficiently to permit incision through normal anterior parietal peritoneum, when the sac and its associated viscera can be explored from the abdominal side.

In sliding hernias the mesenteric attachments of the ascending colon frequently prevent reduction until they are stripped loose from the underlying cellular tissues of the scrotum or inguinal canal in the same manner as they are stripped from their normal position in the iliac fossa in exposing the ureter.

In some cases the line of cleavage is obliterated by inflammatory adhesions, rendering the mobilization of the gut extremely difficult. The blood-vessels supplying the color, which originally coursed between the two leaflets of the primitive mesentery, will be found occupying an extrasaccular position on the posterior wall of the sac at the inner side of the colon. These vessels must be respected or the vitality of the gut will be jeopardized.

Various methods have been proposed for dealing with the sac and extrasaccular intestine. Berger resects the sac and adjacent peritoneum and covers the denuded intestinal surface by introducing a few sutures to form a mesocecum, the two leaflets of which are obtained by folding back the uncut parietal peritoneum at each side of the gut, and he employs a stout suture to close the neck of the sac, which is drawn upward and secured by passing the ends of the suture through the deep muscles of the anterior abdominal wall (Barker method). Morestin does a herniolaparotomy, constructs a mesocecum in the same manner as Berger, and performs an indirect colopexy by suturing the base of the leaflets to the iliac fascia.

Jaboulay, in the "hernia par bascule," reduces the colon first and then the cecum, this being in the reverse order of their descent. Roussel at autopsy and Savariaud at operation saw the mesocolon reform from the peritoneum of the sac wall after reduction of the colon into the abdomen. Their experience indicates the advisability of preserving all the sac in moderate-sized hernia and doing only a partial resection in cases of very large sac.

Recurrences following operation have happened so frequently that some authors advise castration in order to make complete closure of the hernial canal, and others advise herniolaparotomy to permit of direct colopexy. In many cases the redundant part of the sac was excised, the peritoneum closed by suture or ligature, and the extrasaccular loop reduced into the abdominal cavity, with retention of its extraserous position, with a happy result.

Dense adhesions and operative complications, particularly hemorrhage, have led many competent surgeons to refrain from complete reduction of sliding cecal hernia in several instances.

Gangrene of the bowel may necessitate resection of the cecum, colon, or small intestine. Appendectomy, if indicated,

should be performed after the sac and intestine are mobilized in order to prevent the tearing out of the intestinal suture.

No single method of dealing with the sac and intestine is applicable for all cases, and the surgeon must be guided in making his choice by the conditions in each individual patient. The sacless hernias are always small, but usually it is possible, if deemed advisable, to secure a peritoneal covering by slight modification of Berger's method of forming a mesocecum for extrasaccular hernia.

After reduction the parietal wound may be closed by any of the usual methods applicable for inguinal hernia.

ALCOHOL INJECTION TREATMENT IN NEURALGIA AND SPASM.

HARRIS (*Proceedings of the Royal Socicty of Medicine,* March, 1909) after a review of the still scant literature on this subject, thus describes his technique of injection based on a careful study of clinical law and on the results of injections of methylene blue in 50 subjects afterward dissected to determine the exact seat of the deposit of the dye.

For the injection of the inferior maxillary nerve at the foramen ovale a moderately stout, short-pointed needle, 1.2 millimeters in diameter, is pushed through the cheek below the zygoma, as low as possible through the bottom of the sigmoid notch in the lower jar, the point being directed straight inward and upward until it hits the under surface of the sphenoid bone at the base of the skull. The point is then gently lowered by raising the handle, and the edge of the foramen ovale is felt for at a depth of from 1½ to 1¾ inches, according to the size of the individual.

Harris's results have shown him that in practically every case the needle can be made to pass through the foramen into the Gasserian ganglion if necessary.

When attempting to inject the inferior maxillary nerve at the foramen ovale, if the needle is passed straight in and too horizontally the wall of the pharynx will be pierced at a depth of 2 to 2¼ inches. If the point be directed too far backward the middle meningeal artery may be injured, while if the needle be passed too far through the foramen ovale, to the depth of 2¼ inches or more, the cavernous sinus and the internal carotid artery within the skull may be damaged.

For the second division of the fifth nerve the injection is made below the orbit into the infraorbital foramen, taking care to use no force when inserting the needle, or the antrum may be pierced. The direction of the needle must be upward and outward. Besides injecting the infraorbital nerve, the superior maxillary nerve is also injected deeply at the point of its emergence from the foramen rotundum in the sphenomaxillary fossa. To reach this point the needle is pushed through the cheek in front of the coronoid process and below the malar bone, a little in front of the line of the posterior border of the orbital process of the malar bone. The needle is pushed upward and inward until the front edge of the external pterygoid plate is reached. The point of the needle is then passed in front of this bone so as to enter the pterygomaxillary fissure, through which it is pushed, always at the same angle upward, until the nerve is reached. This will vary in depth from 1¾ to 2⅛ inches, according to the size of the skull.

Besides a certain degree of risk of vascular injury there are two most serious dangers to beware of after the point of the needle enters the sphenomaxillary fossa, namely, the danger of piercing the optic nerve or of injecting it with alcohol; and secondly, of passing the needle into the sphenoidal fissure and there damaging the oculomotor nerve. The optic foramen lies not more than three-eighths of an inch beyond the orifice of the foramen rotundum in the same straight line, and it is therefore imperative never to sink the needle to a greater depth than 2 inches, or even 1¾ inches, in the case of a small skull, as of a woman 5 feet 2 inches in height. When the nerve is reached the syringe, ready filled with 80-per-cent alcohol, is fitted tightly on to the needle, and from 15 to 20 minims of 80-per-cent alcohol injected slowly, a few

drops at a time. If no general anesthetic has been given, as is the practice of the Continental and American workers, the patient will cry out with pain as soon as the point of the needle reaches the nerve, and the further injection of the alcohol causes a sharp burning pain over the area of distribution of the nerve, a pain which is repeated with each push of the syringe. The writer prefers to have a general anesthetic given before puncturing the skin, and when his needle is approximately in the correct position for making the injection he allows the patient to come partially round from the anesthetic. Moving the point of the needle then against the nerve will provoke a reflex spasm of that side of the face, as though pain were felt, and the injection can then be made safely, without the patient remembering anything of the pain afterward.

There are other foramina which can be injected with the greatest advantage, namely, the supraorbital notch or foramen, infraorbital foramen, mental foramen, inferior dental foramen, and the palatine foramina, both anterior and posterior. The inferior dental foramen on the inside of the ramus of the lower jaw may be injected with advantage in cases in which the attacks of pain are limited to the lower jaw, without affecting the territory of the lingual nerve, thus avoiding the numbness and loss of sensation in the tongue which would result from injection of the inferior maxillary nerve at the foramen ovale. There are two routes to the inferior dental foramen, either inside the mouth or outside the cheek, round the ramus of the mandible. In either case a stout curved needle is necessary; Schlösser practices the external route, though there is a real danger with this method of producing facial palsy from the alcohol running backward along the needle.

A successful injection, besides producing a sensation of numbness and burning for some hours over the area of the nerve destroyed, always causes a certain amount of edema and a sensation of stiffness of the parts. The burning sensation passes off after a few hours, the edema disappears after two or three days, whilst there is left behind a sensation of numbness; and there is anesthesia to touch and pin-prick on the skin and mucous membrane, corresponding to the anatomical distribution of the nerve. This will last for weeks or months, according to the amount of destruction of the nerve, but will generally begin to diminish after three to four months. The attacks of pain cease immediately after injection, and the delight of the patients on finding they can talk, eat, use their false teeth, or rub the face, is proof that the nerve has been successfully reached. An accident that will occasionally happen is a hematoma from puncture of the artery issuing with the nerve out of the supraorbital, infraorbital, or mental foramina.

FREEZING AS A THERAPEUTIC MEASURE.

JACKSON and HUBBARD (*Medical Record*, April 17, 1909) thus describe the method of making liquid air:

The atmospheric air is dried and cleared from impurities by chemical filtration, and then forced by means of a horizontal double-acting pump into a tank under a pressure of 100 pounds to the square inch. From tank No. 1 it is drawn by a second horizontal pump of similar capacity and forced into a second tank under a pressure of 800 pounds to the square inch, passing on its way through coiled copper tubing jacketed with water in circulation to cool the pipes and remove the heat from the air. In this tank it remains until cooled thoroughly. Then a third pump forces the air through another coil of copper tubing jacketed with water flowing in a direction opposite to the flow of air, into tank No. 3, under a pressure of 2000 pounds to the inch. From this tank it goes into a container. This is a thin, strong metal box set in wool packing. In the upper two-thirds of the container there are coils of tubing jacketed with water. When the air is shown by the gauge to be under proper pressure, and by the thermometer to be of proper temperature, it is allowed to escape from the lower part of the lower coils through small cocks with minute openings

into the lower third of the container, which is a partial vacuum. The air escaping into the vacuum, and already very cool, rapidly expands and becomes still colder. About two-thirds of the air escaping is lost, but one-third remains as a liquid in the container, and can be drawn off through a cock as wanted, just like any other liquid.

Liquid air looks like water, and can be poured out of the container like it. When the finger is dipped in it and hastily withdrawn it feels like water, but the finger comes out dry. When it is thrown on the floor it strikes with a thud, and instantly disappears as steam without dampening the floor. Viewed through the glass container it seems to be boiling quietly, and a delicate vapor floats over the mouth of the flask. The temperature of the air is —252.5° C. So great is its expansive power in its effort to return to its natural state as atmospheric air that it cannot be corked up, as it would blow to atoms anything but the strongest steel cylinders. It is handled in what is called a Dewar bulb, a flask of glass so blown that there is one flask inside of another with a vacuum between. This is placed in a case, and packed all round with wool to prevent too rapid evaporation of the air. Its mouth is partially closed with a loose plug of absorbent cotton so as to allow of the escape of a small amount of vapor that is constantly coming off from the liquid. In this way a liter of the air may be kept for several days.

Carbon dioxide or carbonic acid gas is a gaseous compound of carbon and oxygen, commonly made by the action of hydrochloric acid on calcium carbonate, and purified by passing it through a solution of permanganate of potassium. It is a colorless gas, about one and a half times as heavy as air, with a feeble odor, and slightly acid taste. Its temperature is —31° C. By mixing it with ether and allowing the mixture to evaporate the temperature can be lowered to —100° C. The gas is caused to liquefy under pressure with the aid of a cooling device, somewhat like that used in making liquid air. As it is under a pressure of only 900 pounds to the square inch and has nothing like the expansive power of liquid air, it is delivered in steel cylinders.

Liquid air is best applied by means of swabs made by wrapping absorbent cotton around pieces of wood. These can be made of any size or shape required to fit any lesion. The swab is dipped into the liquid, and when withdrawn is given a sharp jerk to remove the superfluous liquid, and then it is applied to the part to be treated with pressure varying according to the effect we wish to produce.

In order to make carbonic acid snow for freezing purposes the cylinder containing the gas must be placed on a stand, or on a rack fastened to the wall, and at an angle of about 45 degrees. This prevents the freezing of the valve and permits the making of a soft and easily molded mass of snow. The cap covering the vent hole is now to be removed, and all is ready for the making of the snow. There is then held to the vent a brass pipe of sufficient diameter to fit around it which has been cut longitudinally in two parts, hinged on one side, perforated with holes and covered with chamois leather on both surfaces. Before applying this tube a little absorbent cotton is wrapped about the vent hole and a plug of the cotton is put in the further end of the tube, after which it is applied to the vent hole, and gas is allowed to escape at first slowly, then more rapidly. In five or ten seconds fine flakes of snow will blow through the chamois. This is a sign that the apparatus is full of snow. This may be molded into any shape. It gives a temperature of about 98° C., and may be readily handled with the fingers protected by a chamois or a glove. When this snow is brought in contact with the skin the latter turns white at once. The depth will depend upon the amount of pressure used and the length of time of contact. The more superficial the lesion the shorter the time of freezing and the less the amount of pressure. Ten seconds with moderately firm pressure will freeze the part stiff. In a few moments the part will thaw, there will be a zone of redness about it, and in a short time vesicles will form on it. In a day or so a slight crust will form, which when it

falls will leave a scarcely perceptible scar; in a short time this may disappear entirely. Twenty or thirty seconds with firmer pressure will freeze still deeper. Thawing will take place more slowly, and in the course of six to eight hours will be followed by the formation of a tense bulla. The bulla dries into a crust and leaves a slight scar. With longer applications and with deeper pressure the effects are exaggerated. Thus with freezing of about fifty or sixty seconds there follows a bulla that dries down into an eschar that does not fall until about three weeks. The dryness of the crust in all cases is a peculiarity of the action of the snow or air. The scars left by deep freezing are always soft and pliable, more beautiful from a cosmetic standpoint than those left by any other destructive agent.

It is rarely necessary to apply the snow for more than thirty seconds. If it is first dipped in ether or chloroform the time must be reduced as the effect is increased. All crusts should be removed before freezing.

The authors as the result of ten years' experience report no untoward effects. The part should be left alone after freezing. If a bulla forms there is no harm in pricking it. Crusts must not be removed, but allowed to separate of themselves. When they fall a sound skin is left.

It causes slight pain in some subjects and none at all in others. Thawing out is sometimes extremely painful and may remain so for some hours.

If liquid air could be always obtained it would be preferable on account of the ease with which it is applied, the rapidity with which it acts, and its comparative painlessness. The supply of air is most uncertain. The advantages on the side of the carbonic acid snow are: (1) It is always to be had. A cylinder can be kept in one's office for the making of snow at any time, or the snow can be made at any drug shop where soda water is sold. (2) Lesions, no matter how small, can be frozen with it. Unlike liquid air we do not need to freeze any larger surface than necessary, as we can whittle the mass down to any size required. The authors state that the best treatment for lupus erythematosus is freezing. It is not necessary to freeze deeply. Nevi of all sorts are amenable to freezing. Superficial vascular nevi are readily destroyed in from fifteen to fifty seconds. Port-wine marks do not respond as well as other forms of vascular nevi. Pigmentary nevi are easily removed. Hairy nevi also must be frozen deeply, using firm pressure for one or two minutes, so as to destroy the hair follicles.

Epitheliomas, especially of the rodent ulcer type, are particularly amenable to freezing. A cure is effected more rapidly than by any other form of caustic, and with less pain, and the scar is of the best. In them the pressure must be firm, and the time of freezing from half a minute to a minute and a half, depending upon the depth of the ulcer and the thickness of its walls.

Keratosis senilis is readily removed by freezing the warts; papillomata, tattoo marks, powder stains, hypertrophied scars, keloid, tuberculosis verrucosa cutis, chloasma, and scrofuloderma have all yielded to freezing.

In making the snow the use of the tube described is not necessary. A chamois leather bag made by taking a piece of the leather, making several turns with the straight edge about the vent hole, and folding the piece back on itself, answers very well.

SYPHILIS.

STONE (*Medical Record,* April 17, 1909) notes that although the spirochæta pallida does not fulfil all the requirements of the four rules of Koch as regards its etiological connection with the disease, since it cannot be cultivated in artificial media, nevertheless practically all authorities are convinced of its definite etiological relationship. It has been found not only in the primary and secondary lesions, but Schaudinn, Hoffmann, and others have been able to detect its presence in the inflammatory zone near the periphery of gummata.

Hoffmann has shown that the spirochæta pallida is present in the blood three weeks before the manifestation of the roseola. By

the time the primary lesion has developed sufficiently to become noticeable the infection has already reached the lymph channels of the skin papillæ, with free access to the large lymph streams; indeed the organisms have probably reached the lymph channels of the skin papillæ within a few hours of the original infection. Neisser has shown by excision experiments in apes that this probably occurs in eight or ten hours. The spirochætæ do not reach the blood-vessels or begin to wander through the delicate capillary walls until somewhat later. Characteristic hardness of the initial lesion is in part due to the swelling of the surrounding lymph vessels as a result of the obstructive lymphangitis, in part as the result of edema and the filling of the tissue spaces with lymphocytes.

The diagnosis of the primary lesion may be readily and promptly made by means of a dark-field illuminating condenser, the principle of which is such that a system of planoconvex lenses so reflects the light that reflected light only comes through for the illumination of the object. The field itself is dark, while the object to be examined is illumined, thus clearly outlining the latter. In the ordinary Abbé condenser the principle involves the illumination of the field and object by concentration of the rays of direct light on the field. In the dark-field illuminating condenser reflected light only is concentrated on the object, which is intensely illuminated, while the field is dark. Thus ultramicroscopic particles, living bacteria, and organisms of feeble refractile power, such as the spirochæta pallida, are more clearly defined than by any other method of examination in vogue.

In making the diagnosis a smear is made from the primary lesion, after cleansing with a cotton swab, securing some of the serum or exudates as the result of irritation with a small curette or platinum wire loop. A drop of warm salt solution is placed on a thin slide. The secretion obtained by curette or wire is mixed with the drop and a clean cover-glass inverted over it, or one of the enlarged inguinal glands is seized between the fingers and its center punctured with a hypodermic syringe, through which a drop or two of gland juice is aspirated. A smear is prepared in much the same way from a mucous patch, bulla, or condyloma latum. A drop of cedar oil is interposed between the slide and the condenser, not between cover-glass and lens. The No. 7 Leitz dry objective with No. 3 ocular, or still better, No. 8 or No. 12 compensating ocular, is used. If the oil immersion 1.12 is to be used with the dark-field condenser, the lens should be returned to the manufacturer to be fitted with a diaphragm which has been found necessary for this work.

The spirochætæ are seen as illuminated spiral-like organisms, moving in wave-like motions across the fields. In some preparations they are very abundant, whilst in others some search is necessary to find them. A little practice will serve in differentiating the pale spirochætæ from other organisms present in the specimen. In mouth lesions, tonsillar plaques, and tongue fissures one must differentiate it from S. buccalis and S. dentium. In fresh smears kept warm by allowing a little warm salt solution to flow under the edge of the cover-glass from time to time, the motility of all of these forms can be preserved for an hour or two. In a fresh specimen the organism is very active and the spiral windings very thin and sharp, well differentiated, and regular. The flagellum at the end of S. pallida is thin in proportion to the thickness of the body, while the end of the body is thicker than in most of the other forms. The flagellum of S. pallida is also longer as a rule than in other forms.

There seems to be a growing tendency toward excision of the primary lesion as soon as the spirochæta pallida is found. If this be impracticable thorough actual cauterization is indicated, preferably under an anesthetic, followed by a mercurial ointment. Or when this is not feasible the use of a mercurial ointment, such as a 10-per-cent white precipitate ointment or a 10-per-cent calomel ointment, is to be commended. Moreover, the patient should be brought under the constitutional effects of mercury as soon as possible.

ELEPHANTIASIS TREATED BY LYMPHANGIOPLASTY.

HANDLEY (*Proceedings of the Royal Society of Medicine*, March, 1909) under this title, by which he means the passing subcutaneously of silk threads, reports the case of a man forty-six years old, whose trouble began in the left testicle and in the left leg, the latter presenting patches of erythema. Since this time he has been subject to recurrent pyrexial attacks, accompanied by erythema of the limb, which has steadily increased in size. When admitted to the hospital in 1908 the left lower limb was enormously enlarged, especially below the knee. The skin was much thickened, coarse, and rugose.

Filariæ were absent. The first attempt at lymphangioplasty failed, owing to sepsis along the threads set up by micrococci, which were present in the lymph previous to operation. Vaccine treatment was successfully applied to exterminate the infective cocci, and the operation was repeated on October 17, 1908. The swelling rapidly subsided; within ten days the circumference of the limb just above the ankle fell from 21¾ to 12½ inches; of the calf from 25⅜ to 17 inches; and of the knee from 20 to 16¾ inches. The subsidence had since continued less rapidly, the tissues having become soft and flabby, and the skin thin and supple. This case is further detailed in the *Lancet* of January 2, 1909.

REVIEWS.

MODERN MEDICINE: ITS THEORY AND PRACTICE. In Original Contributions by American and Foreign Authors. Edited by William Osler, M.D., Assisted by Thomas McCrae, M.D. Volume V, Diseases of the Alimentary Tract. Illustrated; pp. viii, 903. Philadelphia and New York: Lea & Febiger, 1908.

The fifth volume of Modern Medicine, edited by Osler and McCrae, is devoted to Diseases of the Alimentary Tract, including the liver, pancreas, and peritoneum. The volume opens with an introductory discussion of the digestive apparatus by Charles G. Stockton, who devotes twenty-one pages to the consideration of generalities, including the inter-relation of digestive functions, the importance of motor functions, structural changes resulting from functional disorders, and certain problems of secretion—a knowledge of which may properly be regarded as essential to an accurate appreciation of diseases of the alimentary tract. A realization of the inter-relation of the digestive functions and that defects in the performance of one may be compensated for by the activity of another is of prime importance.

Dr. Reisman writes in his usual careful, judicious manner concerning Diseases of the Mouth and Salivary Glands. The allotment of space in this article is unusually wisely selected, although it may be doubted whether carcinoma of the mouth should be dismissed with five lines and cysts accorded four times the space. The precancerous nature of leukoplakia is well stated.

McCrae's article on Diseases of the Esophagus is well written and complete. The paragraphs dealing with methods of examination might have been elaborated; especially is this true of the sketchy reference to the esophagoscope.

Friedenwald presents an exceptionally detailed, carefully thought out, and interestingly presented chapter on Functional Diseases of the Stomach. Under Nervous Vomiting proper is discussed periodic vomiting, psychic vomiting, juvenile vomiting, periodic vomiting in children, and reflex vomiting. It does not seem to the reviewer that the toxemic vomiting of pregnancy, which is fully and wisely described and treated, is really a form of reflex vomiting. The chapter closes with an excellent review of the polysymptomatic neuroses.

Charles F. Martin's chapter on Organic Diseases of the Stomach, embracing 152 pages, discloses a wide familiarity with the literature of the subject, and a proper sense of proportion in the allotment of space. The author does not hesitate to discuss the indications and in a general way the nature of the operation necessary in gastric ulcer and carcinoma of the stomach, even historically reviewing some of the operative methods. Properly the technique is not considered. Both points are well chosen. Physicians should know when operation is indicated and what operation should be done, but to the surgeon alone belongs the details of operative execution. The statement (p. 293) that "nothing directly of value for the diagnosis of dilatation is afforded by means of the *x*-ray" certainly should be modified. Martin regards congenital hour-glass stomach as a definitely established pathologic entity. Had the writer familiarized himself with Allbutt's essay on the Composition of Scientific Papers he might have avoided such statements as (p. 213) "milk may be given warm and diluted with one-eighth of lime-water or sodium bicarbonate," and probably would have deleted the pronoun "we" which (p. 294) occurs four times in six lines.

Stengel's article on Diseases of the Intestine is written in his usual careful and practical way. The practitioner's familiarity with conditions that are encountered is shown by the detailed consideration of such symptoms as colic, diarrhea, and intestinal hemorrhage. Surgeons who have convinced themselves that intestinal obstruction is not a matter for the consideration of the medical man should read the thirty pages devoted to the subject. The author believes that while immediate or prompt operation is indicated in acute appendicitis, there occur cases which both physician and surgeon must regard as proper for non-operative treatment. Stengel (p. 340) doubts whether the extravagant claims put forward for bacteria-containing foods—sour milk, buttermilk, kumiss, etc.—will be sustained by experience. The chapter abounds in practical therapeutic suggestions; in one instance (p. 348) fourteen remedial measures are included in less than five lines.

The concluding chapters on Diseases of the Peritoneum by Rolleston, Splanchnoptosis, Enteroptosis, Glénard's Diseases by Thomas R. Brown, Diseases of the Pancreas by Eugene L. Opie, and Diseases of the Liver, Gall-bladder, and Ducts by A. O. J. Kelly, fully attain the usual high standards of these writers. The latter-day confusion concerning hepatic cirrhosis is largely ignored, the author accepting as definite clinical entities Laennec's cirrhosis, which he prefers shall be called portal, and Hanot's cirrhosis, for which he selects the name biliary cirrhosis. The plan is eminently practical and permits the author to present in an entirely rational way the clinical phenomena and therapeutic considerations of most value to the practitioner.

The volume appears well indexed and maintains the standard of those that have preceded it. W. M. L. C.

AN ATLAS AND EPITOME OF OPHTHALMOSCOPY AND OPHTHALMOSCOPIC DIAGNOSIS. Second Revised Edition. By Professor Doctor O. Haab. Edited with Additions by George E. de Schweinitz, M.D. The W. B. Saunders Company, Philadelphia, 1909. Price $3.00.

AN ATLAS AND EPITOME OF EXTERNAL DISEASES OF THE EYE. By Professor O. Haab. Edited with Additions by George E. de Schweinitz, M.D. Third Revised Edition. The W. B. Saunders Company, Philadelphia, 1909. Price $3.00.

These two remarkably accurate atlases prepared by a well-known Swiss ophthalmic surgeon, and edited in this country by an equally well-known American ophthalmic surgeon, have been revised and brought up to date in a way which renders them even better than before. At the present time, when the general practitioner is trained during his student days in the use of the ophthalmoscope, and when the use of this instrument is of so much value in clinical medicine aside from its employment in the practice of ophthalmology, the publication of such volumes is most opportune. As Dr. de Schweinitz points out in

his preface to the third edition of the volume dealing with external diseases of the eye, the fact that a third edition is required is indicative of the value in which the book has been held. The editorial comments which he has made have been placed in brackets in order to separate the opinions of the author from the opinions of the editor.

Many atlases contain plates which, in their coloring, vary so materially from the colors of nature as to be of little value, but the lithographs in these atlases are most excellent, and afford correct representation of the ocular conditions which are actually seen in the living patient.

THE INTERNATIONAL MEDICAL ANNUAL. A Yearbook of Treatment and Practitioner's Index. Twenty-seventh Year. E. B. Treat & Company, New York, 1909. Price $3.50.

The appearance of the International Medical Annual is looked forward to by many practitioners because they find in it much that is of practical value. The present issue is up to the standard of its predecessors. It has been compiled by a large number of well-known medical men in this country and abroad. After giving a review of therapeutic progress it proceeds to a consideration of animal extracts, of tuberculin, opsonins, and vaccines. There are also special articles upon appendicitis, epidemic cerebrospinal meningitis, brain and gastric surgery, and tuberculosis.

A MANUAL OF OPERATIVE SURGERY. By Sir Frederick Treves, Bart., G.C.V.O., C.B., LL.D., F.R.C.S., and Jonathan Hutchinson, F.R.C.S. Third Edition, Illustrated. In Two Volumes; Volume I. Cassell & Company, Limited, London, New York, Toronto, and Melbourne, 1909.

The first volume of this last edition of Treves and Hutchinson's Operative Surgery deals with General Principles, Abdominal Operations, and with the Surgery of the Genito-urinary Organs and the Rectum. The authors state that women bear operations somewhat better than men, incident in considerable measure to their natural determination and patience. Moreover, it is pointed out that the best subject for an operation is not the strong, lusty man in the prime of life. This is attributed to the sudden change of habits incident to extensive operation. The advice is given that before operations on the lusty they should be prepared by a few days' confinement to bed on a modified diet. The habitual drunkard is considered the worst subject for operation.

The least favorable frame of mind for operation in so far as the patient is concerned is that characterized by gloomy apathy and a morbid, stoical indifference.

The preparation of the patient is given very briefly, the authors evidently attaching much importance to the antiseptic value of carbolic acid and bichloride of mercury in alcoholic solution.

As to the qualities essential to the operator, it is pointed out that his larger muscles must be developed by vigorous athletic exercise, particularly by fencing, rowing, and practice in the gymnasium, but not immediately before operation. For the development of palmar muscles it is advised that leisure hours be occupied in etching on copper, sketching, or wood carving. The surgeon should serve for some years the apprenticeship of demonstrator of anatomy, must have precision of knowledge, precision of judgment, and precision of hand.

It is advised that the operator wear a sterilized linen jacket, the sleeves of which are rolled up to the elbows. This jacket should entirely cover his ordinary clothes from the collar downward. Beneath this a perfectly clean mackintosh apron should be worn. Rubber gloves are not considered essential to the operator. Sterilized linen caps are approved. Evidently the use of masks occasion some amusement to the authors of this work.

It is interesting to note that Treves's well-known animosity to the use of a director as a part of a surgeon's armamentarium still remains active. It is also quite certain that he has been a potential factor in reducing this instrument to the position of one which is occasionally rather than habitually required. The advice is given to leave silk sutures in the wound from six to eight days, while silkworm-gut sutures

can be left in ten to twelve days or longer if necessary. In spinal analgesia the authors favor stovaine in 5-centigramme doses.

The section which is devoted to abdominal surgery opens with an excellent anatomical description of the abdominal parietes and the best methods of reaching the viscera through them. There is in this section an alluring picture of a pair of Wells forceps which had remained in the patient's abdomen ten and a half years after operation.

The after-treatment of abdominal section is excellently summarized and in accordance with generally accepted practice, though the statement that thrombosis of the veins of the lower limbs is apt to occur in patients who are allowed to stand or walk too soon will probably not meet with general acceptance.

The operations described upon the liver and stomach are those which are now regarded as standard. Considerable space is devoted to operations on hernia, for which the importance of this surgical procedure calls. The operation of ovariotomy, removal of the uterine appendages, and hysterectomy are adequately described.

As a general criticism of this book it is dictated by sound common sense, a thorough anatomical knowledge, and a wide clinical experience, and doubtless accurately mirrors the methods and practices of the English surgeons of the day.

The carping critic might find in its pages a number of departures from the methods recognized as best by the majority of American surgeons. He could, however, confidently depend upon the accuracy of statements, the soundness of advice, and usually the choice of operation.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE.

The education of the Londoner is progressing at a great rate—in matters medical especially so, and that largely by means of exhibitions and conferences. I have, in former communications, referred several times to these various shows, and still another has been held during the past month. This latter has been concerned with nursing and midwifery. The professed objects were to develop an interest among nurses in the advances made in their calling, to give those who live in the country or at a distance an opportunity of seeing the latest novelties, and by means of lectures and demonstrations to teach them something of the latest progress in medicine. To this end several lectures were delivered each day, and many stalls were arranged by the members of popular firms to show their wares. Preparations of milk and artificial foods of various kinds were in great evidence; there was also a model nursery; but the chief attraction was undoubtedly the thermostatic nurse containing a real live baby. This was especially attractive owing to the fact that one of these instruments had been sent to the Queen of Holland, in anticipation of the happy event which has been the topic of interest in all the daily papers for some time past. It rather reminded the spectator of a certain shop window in Regent Street, but of course there were no chickens to be seen. Among the papers those on "The Care of the Teeth" and "The Value of Food" were useful, and of course there was one on "The Influence of Drink on Children." Perhaps the most interesting was that on "The Middle-class Problem" by Dr. Walsh, and in it the author leaned toward the establishment of paying wards. There can be no doubt but that the middle-class patient is in a worse position than either the very rich or the very poor as regards obtaining expert advice. Hospital boards set their minds against any form of hospital abuse, but there is bound to come a change in the

near future, especially as the King's Fund is becoming such a power, owing to the rapid growth of the capital at its disposal. Either this body or some other equally powerful institution will one day take up the question, and we shall have to face a big alteration.

The King's Fund has already succeeded in causing three special hospitals to amalgamate—the National Orthopedic, the Royal Orthopedic, and the City Orthopedic. These three hospitals were separated from one another by a distance of about a mile and a half, and the new institution, under the title of the Royal National Orthopedic Hospital, is being built on the site of one of the former hospitals, in Bolsover Street, Marylebone. When completed it will contain 213 beds as well as a large out-patient department, and will be equipped with all the latest improvements, *x*-ray rooms, and rooms for massage and electrical treatment. One of the best features of the new building is the fire-proof construction. There will also be a gymnasium attached with a complete Zander apparatus, the gift of Mr. Otto Beit. The nursing staff has also been very liberally catered for. The hospital is lucky in that it has a certain amount of real property to fall back on for income. This centralization should render the institution popular alike with students and medical visitors to this country, and promote the study of a subject which is often neglected. Although there was originally considerable opposition to this scheme of amalgamation on the part of the various hospital authorities concerned, there can be no doubt that the King's Fund has done a good work in carrying the project through to a successful issue, and several such schemes will be brought forward in the near future. It cannot be denied that a certain amount of hardship is caused to individual members of the consulting staff, and it may also be a rather bitter pill for the hospital boards to have to sink their identities, but the ultimate gain both in efficiency, economy, and prestige seems to us to warrant such changes.

The London ambulance service has been the subject of an inquiry instituted by the Home Secretary, and the report of this committee was recently issued. Returns have been obtained from the hospitals; witnesses have been examined; several of the larger cities have been visited, and the systems at work in these centers have been inspected and compared with that in the metropolis. The report finds that the present arrangements are quite inadequate and need considerable reforming. It is suggested that authority should be delegated to the Metropolitan Asylums Board to take over the existing installation, to form new regulations, and enter into agreements with the Commissioner of Police as to the formation of new centers, the necessary staff, the method of signalling, etc., and to empower him to enter into an arrangement with the Poor Law Guardians and similar authorities whereby the ambulances should be at the disposal of these bodies at a definite financial rate. One of the committee, however, wished to give the control of this service to the County Council. To the man in the street there does not appear to be any ambulance service in London. Most of the cases of accident are brought up to the hospitals either in cabs or by the vehicle which caused the injury, and in every case a police constable comes as well. It is a soft job for the man in blue, and as many of them are well known to the hospital residents, they frequently get a refresher while waiting. I have seen as many as five policemen visiting the hospital at the same time over one case, and was astonished to find what a large proportion of the "bobbies" are teetotal. Ambulances were chiefly used to fetch up the individual, of whom it has been sung by one of the London hospital men,

> Ev'ry Saturday night at the hospital door
> I sing, "Hic-cup, hic-hic-cup, hic-hic-cup."
> (Tune, *Tit Willow.*)

Last month the new Pathological Department at St. Bartholomew's Hospital was opened. For the study of this branch of medicine a new five-story block has been built and thoroughly equipped with all the

necessary modern appliances for the routine examination of material from the hospital, and room has been reserved for investigation and research. The building will also contain administrative offices, lecture rooms, and laboratories for the students to work in. This branch of medicine is at last receiving proper recognition in London, and there are now several such laboratories. The largest probably is that at University College, but unfortunately there are very few men who are taking advantage of the facilities which are offered, and the private rooms for research stand unoccupied. This is all the more to be regretted seeing that the charges are very moderate, hardly higher than those in Germany, and every help and encouragement is given by those in charge of the department. Similar arrangements exist at St. Mary's Hospital among other places.

Among those to whom science owes a great deal, the name of Gerald Yeo, F.R.S., stands out prominently, and it is with deep regret that we have to record his death, which occurred last month. He was Professor of Physiology at King's College from 1874 till 1890, and during this time he wrote what was then the standard textbook on the subject. He was also one of the little band who fought the battle for experimental work, and was with Professor Ferrier, one of his colleagues, involved in litigation in this cause. Gerald Yeo was one of the best of the Irishmen, and many of his trite remarks will remain at King's long after the author has been forgotten. In the latter part of his life after he retired the Professor lived in the country, where he did not enjoy the best of health. He was only seen in London on rare occasions, and generally then at a meeting of the Physiological Society, of which he was the first secretary.

Sheffield has also lost one of her most distinguished men by the death of Mr. Simeon Snell, the first professor of ophthalmology after the University was founded. Mr. Snell was also known for the interest he had taken in the effect of trade occupations on the eye, and was last year President of the British Medical Association, when the annual meeting was held at Sheffield.

THE USE OF MAGNESIUM SULPHATE EXTERNALLY.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I have noticed in your journal several times within the last eighteen months reference made to the external use of Epsom salts for local inflammation, credit for the use being given to Dr. Henry Tucker, of Philadelphia. I believe in giving "honor to whom honor is due."

I have a little book, copyrighted November 15, 1904, written by Dr. W. H. Burgess, of Avondale, Chattanooga, Tenn., who recommends Epsom salts for all local inflammations such as erysipelas and orchitis, and also for rheumatism and similar conditions.

I have used the solution as recommended by Dr. Burgess frequently as an external application and got good results therefrom, but of course did not find it a panacea, as he seems to believe it is. I think, however, he deserves the credit for recommending its use in circumscribed forms of inflammation. I read of its local use for burns, however, fourteen years ago.

During the past two years I have found it in the strength of one to four drachms to the pint of water more efficient in all congested and acutely inflamed conditions of mucous membranes, especially of the pelvic organs, as a hot douche. My use of it that way was suggested by Burgess's book recommending its external use. To what is due its extraordinary healing effect I am not sure, except that on mucous membranes it produces a decided exosmosis, relieving the tension and swelling, and Burgess's claim of its great affinity for carbon, which is the basic element of all ptomaines and leucomaines, etc., is also one of its modes of action.

Yours truly,

J. W. TORBETT, M.D.

MARLIN, TEXAS.